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JC525 U.S. PTO 10/27/99

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	8535-029-999	Total Pages	307
First Named Inventor or Application Identifier			
Nehls *et al.*			
Express Mail Label No.	EL 452 479 866 US		

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: **Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231**

1. ☒ Fee Transmittal Form
   Submit an original, and a duplicate for fee processing)
2. ☒ Specification [*Total Pages* 84]
   (preferred arrangement set forth below)
   - -Descriptive title of the Invention
   - -Cross Reference to Related Applications
   - -Statement Regarding Fed sponsored R&D
   - -Reference to Microfiche Appendix
   - -Background of the Invention
   - -Brief Summary of the Invention
   - -Brief Description of the Drawings *(if filed)*
   - -Detailed Description of the Invention (including drawings, *if filed*)
   - -Claim(s)
   - -Abstract of the Disclosure
3. ☒ Drawing(s) *(35 USC 113)* [*Total Sheets* 1]
4. ☒ Oath or Declaration (unexecuted) [*Total Sheets* 2]
   a. ☐ Newly executed (original or copy)
   b. ☐ Copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 17 completed)
   [Note Box 5 below]
   i. ☐ DELETION OF INVENTORS(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33 (b).
5. ☐ Incorporation By Reference *(useable if Box 4b is checked)*
   The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Microfiche Computer Program *(Appendix)*
7. ☒ Nucleotide and/or Amino Acid Sequence Submission
   (if applicable, all necessary)
   a. ☐ Computer Readable Copy
   b. ☒ Paper Copy (219 pages)
   c. ☐ Statement verifying identity of above copies

JC549 U.S. PTO 09/428674 10/27/99

ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)* ☐ Power of Attorney
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
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14. ☐ Small Entity Statement(s) Statement filed in prior application, Status still proper and desired
15. ☐ Certified Copy of Priority Document(s)
    (if foreign priority is claimed)
16. ☐ Other:

17. **If a CONTINUING APPLICATION,** *check appropriate box and supply the requisite information:*
☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No: 60/106,442 filed October 30, 1998.

18. CORRESPONDENCE ADDRESS

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ATTORNEY DOCKET NO. 8535-029-999

Date: October 27, 1999

Assistant Commissioner for Patents
Box PATENT APPLICATION
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Sir:

The following utility patent application is enclosed for filing:

Applicant(s): Nehls *et al.*

Executed on: Unexecuted

Title of Invention: **NOVEL HUMAN POLYNUCLEOTIDES AND THE POLYPEPTIDES ENCODED THEREBY**

PATENT APPLICATION FEE VALUE

TYPE	NO. FILED	LESS	EXTRA	EXTRA RATE	FEE
Total Claims	9	-20	0	$18.00 each	$ 0.00
Independent	4	-3	1	$78.00 each	$ 78.00
				Minimum Fee	$ 760.00
				Multiple Dependency Fee If Applicable ($260.00)	$ 0.00
				Total	$ 838.00
				50% Reduction for Independent Inventor, Nonprofit Organization or Small Business Concern (a verified statement as to the applicant's status is attached)	- $ 419.00
				Total Filing Fee	$ 419.00

☒ Priority of application no. 60/106,442 filed on October 30, 1998 is claimed under 35 U.S.C. § 119.

A copy of this sheet is enclosed.

Respectfully submitted,

by Norbert Stahl
Reg. No. 44,350

Laura Coruzzi

Laura A. Coruzzi
PENNIE & EDMONDS LLP

30,742
(Reg. No.)

Enclosure

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CA1 - 229985.1

NOVEL HUMAN POLYNUCLEOTIDES AND THE POLYPEPTIDES ENCODED THEREBY

This application claims priority to United States Provisional Application No. 60/106,442, filed October 30, 1998, which is also incorporated herein by reference for any purpose.

1. FIELD OF THE INVENTION

The present invention is in the field of molecular genetics. The application discloses novel nucleic acid sequences that partially define the scope of human exons that can be trapped and identified by the disclosed vectors/methods, and which are useful, *inter alia*, for identifying the organization of the coding regions and of the human genome.

2. BACKGROUND OF THE INVENTION

The Human Genome Project and privately financed ventures are currently sequencing the human genome, and the substantial completion of this milestone is expected before the year 2003. The hope is that, at the conclusion of the sequencing phase, a comprehensive representation of the human genome will be available for biomedical analysis. However, the data resulting from such efforts will largely comprise human genomic sequence of which only a fraction actually encodes expressed sequence information. Although sophisticated computer-assisted exon identification programs can be applied to such genomic sequence data, the computer predictions require verification by laboratory analysis to actually identify the coding regions of the genome. Consequently, the availability of cDNA information will significantly contribute to the value of the human genomic sequence since cDNA sequence provides a direct indication of the presence of transcribed sequences as well as the location of splice junctions. Thus, the sequencing of cDNA libraries to obtain expressed sequence tags (or ESTs) that identify exons expressed within a given tissue, cell, or cell line is currently in progress. As a consequence of these efforts, a large number of EST sequences are presently compiled in public and privately held databases. However, the present EST paradigm is inherently limited by the levels and extent of mRNA production within a given cell. A related problem is the lack of cDNA sources from specific tissue and developmental

expression profiles. In addition, some genes are typically only active under certain physiological conditions or are generally expressed at levels below or near the threshold necessary for cDNA cloning and detection and are therefore not effectively represented in current cDNA libraries.

Researchers have partially addressed these issues by using phage vectors to clone genomic sequences such that internal exons are trapped (Nehls, *et al.*, 1994, Current Biology, *4(1)*:983-989, and Nehls, *et al.*, 1994, Oncogene, *9*:2169-2175). However, such libraries require the random cloning of genomic DNA into a suitable cloning vector *in vitro*, followed by reintroduction of the cloned DNA *in vivo* in order to express and splice the cloned genes prior to producing the cDNA library. Additionally, such methods can only "trap" the internal exons of genes. Consequently, genes containing a single exon or a single intron are typically not trapped by traditional methods of exon trapping.

3. SUMMARY OF THE INVENTION

The subject invention provides numerous isolated and purified novel human cDNAs produced using gene trap technology. The novel human gene trapped sequences (GTSs) of the subject invention are disclosed as SEQ ID NOS:9-1008 in the appended Sequence Listing.

The subject invention further contemplates the use of one or more of the subject GTSs, or portions thereof, to isolate cDNAs, genomic clones, or full-length genes/polynucleotides, or homologs, heterologs, paralogs, or orthologs thereof, that are capable of hybridizing to one or more of the disclosed GTSs or their complementary sequences under stringent conditions.

The subject invention additionally contemplates methods of analyzing biopolymer (*e.g.*, oligonucleotides, polynucleotides, oligopeptides, peptides, polypeptides, proteins, etc.) sequence information comprising the steps of loading a first biopolymer sequence into or onto an electronic data storage medium (*e.g.*, digital or analogue versions of electronic, magnetic, or optical memory, and the like) and comparing said first sequence to at least a portion of one of the polynucleotide sequences, or amino acid sequence encoded thereby, that is first disclosed in, or otherwise unique to, SEQ ID NOS:9-1008. Typically, the

polynucleotide sequences, or amino acid sequences encoded thereby, will also be present on, or loaded into or onto a form of electronic data storage medium, or transferred therefrom, concurrent with or prior to comparison with the first polynucleotide.

Another embodiment of the invention is the use of a oligonucleotide or polynucleotide sequence first disclosed in at least a portion of at least one of the GTS sequences of SEQ ID NOS:9-1008 as a hybridization probe. Of particular interest is the use of such sequences in conjunction with a solid support matrix/substrate (resins, beads, membranes, plastics, polymers, metal or metallized substrates, crystalline or polycrystalline substrates, etc.). Of particular note are spatially addressable arrays (*i.e.*, gene chips, microtiter plates, etc.) of polynucleotides wherein at least one of the polynucleotides on the spatially addressable array comprises an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008.

Similarly, one or more oligonucleotide probes based on, or otherwise incorporating, sequences first disclosed in any one of SEQ ID NOS:9-1008, can be used in methods of obtaining novel gene sequence via the polymerase chain reaction or by cycle sequencing. Similar oligonucleotide hybridization probes can also comprise sequence that is complementary to a portion of a sequence that is first disclosed in, or preferably unique to, at least one of the GTS polynucleotides in the sequence listing. The oligonucleotide probes will generally comprise between about 8 nucleotides and about 80 nucleotides, preferably between about 15 and about 40 nucleotides, and more preferably between about 20 and about 35 nucleotides.

Moreover, an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008 can be incorporated into a phage display system that can be used to screen for proteins, or other ligands, that are capable of binding an amino acid sequence encoded by an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008.

An additional embodiment of the present invention is a library comprising individually isolated linear DNA molecules corresponding to at least a portion of the described human GTSs which are useful for synthesizing physically contiguous sequences of overlapping GTSs by, for example, the polymerase chain reaction (PCR).

The subject invention also provides for an antisense molecule which comprises at least a portion of sequence that is first disclosed in, or preferably unique to, at least one of the GTS polynucleotides.

The subject invention also contemplates a purified polypeptide in which at least a portion of the polypeptide is encoded by, and thus first disclosed by, at least a portion of a GTS of the present invention. The invention also relates to naturally occurring polynucleotides comprising the disclosed GTSs that are expressed by promoter elements other than the promoter elements that normally express the GTSs in human cells (*i.e.*, gene activated GTSs). Such promoter elements can be directly incorporated into the cellular genome or recombinantly engineered upstream from at least a portion of a GTS (preferably at least about 50, more preferably at least about 75, and most preferably at least about 100 to 130 base in length) of the present invention, or a complement thereof. A particularly preferred embodiment includes recombinantly engineered expression vectors that similarly have or incorporate at least a, preferably unique, portion of the disclosed GTSs or complement thereof.

4. DESCRIPTION OF THE SEQUENCE LISTING AND FIGURES

The Sequence Listing is a compilation of nucleotide sequences obtained by sequencing a human gene trap library that at least partially identifies the genes in the target cell genome that can be trapped by the described gene trap vectors (*i.e.*, the repertoire of genes that are active or have not been inactivated).

Figures 1A-1D. Figure 1A illustrates a retroviral vector that can be used to practice the described invention. Figure 1B shows a schematic of how a typical cellular genomic locus is effected by the integration of the retroviral construct into intronic sequences of the cellular gene. Figure 1C shows the chimeric transcripts produced by the gene trap event as well as the locations of the binding sites for PCR primers. Figure 1D shows how the PCR amplified cDNAs are directionally cloned into a suitable GTS vector.

5. DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to novel human polynucleotide sequences obtained from cDNA libraries generated by the normalized expression of genomic exons using gene trap technology. In particular, the disclosed novel polynucleotides were generated using a modified reverse-orientation retroviral gene trap vector that was nonspecifically integrated into the target cell genome, although other polynucleotide (DNA or RNA) gene trap vectors could have been introduced to the target cells by, for example, transfection, electroporation, or retrotransposition. Preferred retroviral vectors that can be used to practice the present invention (as well as methods and recombinant tools for making and using the described GTSs) are disclosed in, *inter alia*, U.S. Application Ser. No. 09/276,533, filed March 25, 1999 which is herein incorporated by reference in its entirety.

After integration, the exogenous promoter of the sequence acquisition, or 3' gene trap, component of the vector was used to express and splice a chimeric mRNA that was subsequently reverse transcribed, amplified, and subject to DNA sequence analysis. Unlike conventional cDNA libraries, the presently disclosed libraries are largely unaffected by the bias inherent in cDNA libraries that rely solely on endogenous mRNA expression. Additionally, by integrating a vector into the target cell genes, a chimeric mRNA is produced that allows for the specific expansion and isolation of cDNAs corresponding to the chimeric mRNAs using vector specific primers.

As used herein the term “gene trapped sequence”, or “GTS”, refers to nucleotide sequences that correspond to naturally occurring endogenously encoded human exons that have been expressed as part of a chimeric “gene trapped” mRNA. Typically, the chimeric mRNA incorporates at least a portion of sequence that has been engineered into the sequence acquisition exon of a gene trap vector which, *inter alia*, facilitates cDNA production by reverse transcriptase and amplification of the cDNA by PCR to produce an isolated linear DNA molecule. The disclosed GTSs do not include vector encoded sequences.

The term "GTS" not only refers to polynucleotides that are exactly complementary to naturally occurring human mRNA, but also refers to "GTS derivatives". The term “GTS derivative” also refers to heterologs, paralogs, orthologs, and allelic variants of the specific

GTSs described herein. In addition, a GTS may include the complete coding region for a naturally occurring peptide or polypeptide. A GTS may also include a complete open reading frame.

The term "GTS peptide" as used herein includes oligopeptides or polypeptides sharing biological activity and/or immunogenicity (or immunological cross-reactivity) with an amino acid sequence encoded by at least one of the disclosed GTSs or complement thereof. The terms "biological activity" (or "biological characteristics") of a polypeptide refers to the structural or biochemical function of the polypeptide in the normal biological processes of the organism in which the polypeptide naturally occurs. Examples of such characteristics include protein structure and/or conformation, which can be determined biochemically by reaction with appropriate ligands or receptors or by suitable biological assays.

A GTS peptide may also correspond to a full-length naturally occurring peptide or polypeptide. GTS peptides can have amino acid sequences that directly correspond to naturally occurring polypeptides or amino acid sequences or can comprise minor variations. Such variations can include amino acid substitutions that are the result of the replacement of one amino acid with another amino acid having a similar structural and/or chemical properties, such as the substitution of a leucine with an isoleucine or valine, an aspartate with a glutamate, or a threonine with a serine, *i.e.*, conservative amino acid replacements. Additional variations include minor amino acid deletions and/or insertions, typically in the range of about 1 to 6 amino acids, and can also include one or more amino acid substitutions. Guidance in determining which GTS peptide amino acid residues can be replaced or deleted without abolishing the biological activity of interest may be determined empirically, or by using computer amino acid sequence databases to identify polypeptides that are homologous to a given GTS peptide and trying to avoid amino acid substitutions in conserved regions of homology.

"Homology" refers to the similarity or the degree of similarity between a reference, or known polynucleotide and/or polypeptide and a test nucleotide sequence and/or its corresponding amino acid sequence. As used herein, "homology" is defined by sequence similarity between a reference sequence and at least a portion of the newly sequenced

nucleotide. Typically, a corresponding amino acid sequence similarity should exist between the peptides encoded by such homologous sequences.

To determine whether proteins are homologous, the GTS sequence is translated into the corresponding amino acid sequence. The amino acid sequence is then compared with reference polypeptide sequences. A short string of matching amino acid sequence can constitute good evidence of homology (for example, repeating Gly-Pro-X sequence, or the presence of an RGD motif). However, typically a larger number of similar amino acids is required to label two sequences homologous. Generally, the match needs to be at least about 7 or 8 amino acids, among which perhaps one mismatch is allowed. These criteria allow good sensitivity in finding all relevant sequences while providing a threshold amount of selectivity.

After peptide homology has been found, the respective nucleotide sequences are compared. An alignment of the reference and new sequences should show at least about 60%, and preferably at least about 65%, agreement over the minimum of 21 nucleotides which correspond to the 6 matching amino acids. Generally, a low percentage of agreement is acceptable if the differences are in the "wobble" position (or third nucleotide of the triplet coding for an amino acid).

As used herein, a "mutated" polypeptide has an altered primary structure typically resulting from corresponding mutations in the nucleotide sequence encoding the protein or polypeptide. As such, the term "mutated" polypeptides can include allelic variants. Mutational changes in the primary structure of a polypeptide result from deletions, additions or substitutions. A "deletion" is defined as a change in a polypeptide sequence in which one or more internal amino acid residues are absent. An "addition" is defined as a change in a polypeptide sequence which has resulted in one or more additional internal amino acid residues as compared to the wild type. A "substitution" results from the replacement of one or more amino acid residues by other residues. A polypeptide "fragment" is a polypeptide consisting of a primary amino acid sequence which is identical to a portion of the primary sequence of the polypeptide to which the polypeptide is related.

A host cell "expresses" a gene or DNA when the gene or DNA is transcribed into RNA that may optionally be translated to produce a polypeptide.

The subject invention also includes GTSs which are incorporated into expression vectors and transformed into host cells which subsequently express the polynucleotides and/or polypeptides encoded by the GTSs.

The subject invention also includes antibodies capable of specifically binding to GTS peptides, as well as methods of detecting a GTS peptides or the corresponding protein by combining a sample for analysis with an antibody capable of specifically binding to a GTS peptide and detecting the formation of antibody complexes present in the sample.

The subject invention also includes a method of isolating a GTS peptide, or its corresponding protein comprising the step of separating the GTS peptide, or its corresponding protein, from a solution utilizing an antibody capable of specifically binding to the GTS peptide or its corresponding protein.

The subject invention also provides for markers for use in detecting diseases, biological events, cell types and tissues which comprise at least a portion of a GTS sequence.

Further, the subject invention provides polynucleotide markers useful for physical and genetic mapping of the human, and/or certain model organism, genome(s). In particular, the nucleotide sequences in the Sequence Listing provide sequence tagged sites (STS), that will be useful in completing an STS-based physical map of the human genome, a goal of the human genome project (Collins, F. and Galas, D. (1993) Science *262*:43-46). Additionally, some of these sequences will identify new genes. These new genes will be useful in completing physical and genetic maps of all the genes in the human genome, another goal of the human genome project.

The exons contained in the disclosed GTSs contain open reading frames (present in one of the three reading frames in either orientation of the sequence). Typically, the gene trap strategy employed to generate the GTS sequences allows for the directional cloning and identification of the sense strand. However, it is possible that occasional sequencing errors or random reverse transcription, or PCR aberrations will mask the presence of the appropriate open reading frame. In such cases of sequencing error, it is possible to determine the corresponding GTS sequence by expressing the GTS in an appropriate expression system and determining the amino acid sequence by standard peptide mapping and sequencing techniques (Current Protocols in Molecular Biology, John Wiley & Sons, Vol. 2, Sec 16,

1989). Additionally, the actual reading frame and amino acid sequence of a given nucleotide sequence may be determined by *in vitro* synthesis of a portion of an oligopeptide comprising a possible amino acid sequence and preparing antibodies to the oligopeptide. If the antibodies react with cells from which the GTS of interest was derived, the reading frame is likely correct. Alternatively, codon usage analysis can be used to track and correct reading frame shifts in gene sequence data.

The correct amino acid sequence of a GTS protein is largely a function of the DNA sequence and the correct amino acid sequence can be readily determined using routine techniques. For example, by providing independent three fold sequencing coverage of the GTS library, random sequencing/RT/PCR errors can be identified and corrected by selecting the sequence represented by the majority of gene trap sequences covering a given nucleotide.

The nucleotide sequences of the Sequence Listing may contain some sequencing errors and several of the nucleotide sequences of the Sequence Listing may contain nucleotides that have not been precisely identified, typically designated by an N, rather than A, T, C, or G. Since each of the nucleotide sequences presented in the Sequence Listing is believed to uniquely identify a novel GTS, any sequencing errors or N's in the nucleotide sequences of the Sequence Listing do not present a problem in practicing the subject invention. Several methods employing standard recombinant methodology, for example, as described in Molecular Cloning: Laboratory Manual 2nd ed., Sambrook *et al.* (1989), Cold Spring Harbor Laboratory, Cold Spring Harbor, NY (or periodic updates thereof), may be used to correct errors and complete the missing sequence information. For example, a nucleotide and/or oligonucleotide corresponding to a portion of a nucleotide sequence of GTS of interest, can be chemically or biochemically synthesized *in vitro,* and used as a hybridization probe to screen a cDNA library in order to identify and obtain library isolates comprising recombinant DNA sequences containing the GTS cDNA sequence of interest. The library isolate may then be independently subjected to nucleotide sequencing using one or more standard sequencing procedures so as to obtain a complete and accurate nucleotide sequence.

For the purposes of this disclosure, the term "isolated and purified polynucleotide" comprises a polynucleotide purified from a natural cell or tissue as well as polynucleotides

which are complementary to the polynucleotides isolated from the natural cell or tissue. One example of an isolated or purified polynucleotide, or a substantially isolated preparation thereof, is a preparation where the polynucleotide of interest represents at least about 80 percent, preferably at least about 85 percent, and more preferably at least about 90 to 95 percent or more of the net product(s) that can be visualized on a DNA agarose gel stained with ethidium bromide.

The described GTSs were obtained from isolates of a cDNA library. Clones isolated from cDNA libraries generated by 3' gene trapping typically contain only a portion of the mature RNA transcript that has been spliced to a vector encoded sequence acquisition exon, and therefore such clones may only encode a portion of the polypeptide of interest (however, it should be appreciated that a number of the disclosed GTSs may encode full- length ORFs). To obtain the remainder of the sequence, the GTSs can be used as hybridization probes to re-screen the same or a different cDNA library, and additional clones isolated by the re-screening can be purified and characterized using standard methods (Benton and Davis, 1977, Science, *196*:180-183). Once sufficiently purified, the size of the DNA insert can be approximated by agarose gel electrophoresis and the larger clones can be analyzed to determine the exact number of bases by DNA sequencing. Frequently, the use of a library different from the one which contained the original clone is useful for this purpose, and particularly a library that has been prepared with extra care to extend cDNA synthesis to full-length, or a library that has been intentionally primed with random primers in order to "jump over" particularly difficult regions of the transcript sequence.

Missing upstream DNA sequence can also be obtained by "primer extension" of the cDNA isolate, a practice common in the art (Sambrook *et al.* (1989), Molecular Cloning: Laboratory Manual 2nd ed. pg 7.79-7.83, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY), whereby a sequence-specific oligonucleotide is used to prime reverse-transcription near the 5'-end of the cDNA clone and the resulting product is either cloned into a bacterial vector or is analyzed directly by DNA sequencing. Finally, newer methods to extend clones in either direction employ oligonucleotide-directed thermocyclic DNA amplification of the missing sequences, wherein a combination of a cDNA-specific primer and a degenerate, vector-specific, or oligo-dT-binding second oligonucleotide can be used to

prime strand synthesis. In any of the above methods or other methods of detecting additional cDNA sequence, two or more resulting clones containing the partial cDNA sequence can be recombined to form a single full-length cDNA by standard cloning methods. The resulting full-length cDNA may subsequently be transferred into any of a number of appropriate expression vectors.

In many instances, the sequencing of clones resulting from independent nonspecific gene trap events will result in a natural redundancy of sequencing more than one cDNA from a particular gene. As discussed above, this feature is a built in form of error detection and correction. These independent gene trap events can also be combined using the various overlapping regions of sequence into an entire contiguous sequence ("contig") containing the complete nucleotide sequence of the full length cDNA. Similar methodology can be used to combine one or more GTSs with one or more publicly available, or proprietary, ESTs to synthesize, electronically or chemically, a contiguous sequence.

The ABI Assembler application, part of the INHERITS DNA analysis system (Applied Biosystems, Inc., Foster City, CA), creates and manages sequence assembly projects by assembling data from selected sequence fragments into a larger sequence. The Assembler combines two advanced computer technologies which maximize the ability to assemble sequenced DNA fragments into Assemblages, a special grouping of data where the relationships between sequences are shown by graphic overlap, alignment and statistical views. The process is based on the Meyers-Kececioglu model of fragment assembly (INHERITS™ Assembler User's Manual, Applied Biosystems, Inc., Foster City, CA), and uses graph theory as the foundation of a very rigorous multiple sequence alignment program for assembling DNA sequence fragments. Additional methods of using GTSs and obtaining full length versions thereof are discussed in U.S. Patent No. 5,817,479, herein incorporated by reference.

It will be appreciated by those skilled in the art that as a result of the degeneracy of the genetic code (see, for example, Table 4-1 at page 109 of "Molecular Cell Biology", 1986, J. Darnell *et al.* eds., Scientific American Books, New York, NY, herein incorporated by reference) a multitude of GTS nucleotide sequences, some bearing minimal nucleotide sequence homology to the nucleotide sequence of genes naturally encoding GTS peptides,

can be produced. The invention has specifically contemplated each and every possible variation of nucleotide sequence that could be made by selecting combinations based on possible codon choices. These combinations are made in accordance with the standard triplet genetic code as applied to the nucleotide sequence of naturally occurring human GTS nucleotide sequences and all such variations are to be considered as being specifically disclosed. Once the triplet codons are "translated" (which can be done electronically) into their amino acid counterparts, the amino acid sequences encoded by the GTS ORFs effectively represent a generic representation of the various nucleotide sequences that can encode the amino acid sequence (*i.e.*, each amino acid is generic for the various nucleotide codons that correspond to that amino acid).

The presently described novel human GTSs provide unique tools for diagnostic gene expression analysis, for cross species hybridization analysis, for genetic manipulations using a variety of techniques, like, for example, antisense inhibition, gene targeting, the identification or generation of full-length cDNA, mapping exons in the human genome, identifying exon splice junctions, gene therapy, gene delivery, chromosome mapping, etc. Furthermore, the expression-based detection and isolation of the described novel polynucleotides verifies that the genes encoding these sequences have not been inactivated by, for example, the covalent modification (methylation, acetylation, glycosylation, etc.) of the target cell genome, or inhibiting the function of transcriptional control elements. The fact that the genes have not been inactivated in the target cell genome can indicate an involvement in cellular metabolism, catabolism, homeostasis, or any of a wide variety of developmental and cell differentiation processes or the regulation of physiological or endocrine functions in the body, etc. (although treating the target cell with, for example, histone deacetylators can partially compensate for such inactivation and expand the target size of a given trapping construct). These data are especially useful when correlated with cDNA data from differentiated tissues and/or cells or cell lines in order to determine whether the absence of expression is regulated at the level of transcription or gene inactivation.

5.1 POLYNUCLEOTIDES OF THE PRESENT INVENTION

The nucleotide sequences of the various isolated human GTSs of the present invention appear in the Sequence Listing as SEQ ID NOS:9-1008. Additional embodiments of the present invention are GTS variants, or homologs, paralogs, orthologs, etc., which include isolated polynucleotides, or complements thereof, that hybridize to one or more of the disclosed GTSs of SEQ ID NOS:9-1008 under stringent, or preferably highly stringent, conditions. By way of example and not limitation, high stringency hybridization conditions can be defined as follows: Prehybridization of filters containing DNA to be screened is carried out for 8 h to overnight at 65°C in a buffer containing 6X SSC, 50mM Tris-HCl (pH 7.5), 1mM EDTA, 0.02% PVP, 0.02% Ficoll, 0.02% BSA, and 500 μg/ml denatured salmon sperm DNA. Filters are hybridized for 48 h at 65°C in prehybridization mixture containing 100μg/ml denatured salmon sperm DNA and 5-20 x 10^6 cpm of ^{32}P-labeled probe (alternatively, as in all hybridizations described herein, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used). The filters are then washed in approximately 1X wash mix (10X wash mix contains 3M NaCl, 0.6M Tris base, and 0.02M EDTA, alternatively, as with all washes described herein, 2X, 3X, 4X, 5X, 6X wash mix, or more, can be used) twice for 5 minutes each at room temperature, then in 1X wash mix containing 1% SDS at 60°C (alternatively, as in all washes described herein, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min, and finally in 0.3X wash mix (alternatively, as in all final washes described herein, approximately, 0.2X, 0.4X, 0.6X, 0.8X, 1X, or any concentration between about 2X and about 6X can be used in conjunction with a suitable wash temperature) containing 0.1% SDS at 60°C (alternatively, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min. The filters are then air dried and exposed to x-ray film for autoradiography. In an alternative protocol, washing of filters is done for 37°C for 1 h in a solution containing 2X SSC,

0.01% PVP, 0.01% Ficoll, and 0.01% BSA. This is followed by a wash in 0.1X SSC at 50°C for 45 min before autoradiography. Another example of hybridization under highly stringent conditions is hybridization to filter-bound DNA in 0.5 M $NaHPO_4$, 7% sodium dodecyl

sulfate (SDS), 1 mM EDTA at 65°C, and washing in 0.1xSSC/0.1% SDS at 68°C (Ausubel F.M. *et al.*, eds., 1989, Current Protocols in Molecular Biology, Vol. I, Green Publishing Associates, Inc., and John Wiley & sons, Inc., New York, at p. 2.10.3).

Preferably, such GTS variants will encode at least a portion or domain of a, preferably naturally occurring, protein or polypeptide that encodes a functional equivalent to a protein or polypeptide, or portion or domain thereof, encoded by the disclosed GTSs. Additional examples of GTS variants include polynucleotides, or complements thereof, that are capable of binding to the disclosed GTSs under less stringent conditions, such as moderately stringent conditions, (*e.g.*, washing in 0.2xSSC/0.1% SDS at 42° C (Ausubel *et al.*, 1989, *supra*). Moderately stringent conditions can be additionally defined, for example, as follows: Filters containing DNA are pretreated for 6 h at 55°C in a solution containing 6X SSC, 5X Denhart's solution, 0.5% SDS and 100 μg/ml denatured salmon sperm DNA. Hybridizations are carried out in the same solution and 5-20 x 10^6 cpm ^{32}P-labeled probe is used. Filters are incubated in hybridization mixture for 18-20 h at 55°C (alternatively, as in all hybridizations described herein, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used in combination with a suitable concentration of salt). The filters are then washed in approximately 1X wash mix (10X wash mix contains 3M NaCl, 0.6M Tris base, and 0.02M EDTA, alternatively, as with all washes described herein, 2X, 3X, 4X, 5X, 6X wash mix, or more, can be used) twice for 5 minutes each at room temperature, then in 1X wash mix containing 1% SDS at 60°C (alternatively, as in all washes described herein, approximately, 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min, and finally in 0.3X wash mix (alternatively, as in all final washes described herein approximately 0.2X, 0.4X, 0.6X, 0.8X, 1X, or any concentration between about 2X and about 6X can be used in conjunction with a suitable wash temperature) containing 0.1% SDS at 60°C (alternatively, approximately 42, 44, 45, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min. The filters are then air dried and exposed to x-ray film for autoradiography.

In an alternative protocol, washing of filters is done twice for 30 minutes at 60°C in a solution containing 1X SSC and 0.1% SDS. Filters are blotted dry and exposed for autoradiography.

Other conditions of moderate stringency which may be used are well-known in the art. For example, washing of filters can be done at 37°C for 1 h in a solution containing 2X SSC, 0.1% SDS. Another example of hybridization under moderately stringent conditions is washing in 0.2xSSC/0.1% SDS at 42°C (Ausubel et al., 1989, *supra)*. Such less stringent conditions may also be, for example, low stringency hybridization conditions. By way of example and not limitation, procedures using such conditions of low stringency are as follows (see also Shilo and Weinberg, 1981, Proc. Natl. Acad. Sci. USA 78:6789-6792): Filters containing DNA are pretreated for 6 h at 40°C in a solution containing 35% formamide, 5X SSC, 50mM Tris-HCl (pH 7.5), 5mM EDTA, 0.1% PVP, 0.1% Ficoll, 1% BSA, and 500 μg/ml denatured salmon sperm DNA. Hybridizations are carried out in the same solution with the following modifications: 0.02% PVP, 0.02% Ficoll, 0.2% BSA, 100μg/ml salmon sperm DNA, 10% (wt/vol) dextran sulfate, and 5-20 X 10^6 cpm ^{32}P-labeled probe is used. Filters are incubated in hybridization mixture for 18-20 h at 40°C (alternatively, as in all hybridizations described herein, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used). The filters are then washed in approximately 1X wash mix (10x wash mix contains 3M NaCl, 0.6M Tris base, and 0.02M EDTA, alternatively, as with all washes described herein, 2X, 3X, 4X, 5X, 6X wash mix, or more, can be used) twice for five minutes each at room temperature, then in 1X wash mix containing 1% SDS at 60°C (alternatively, as in all washes described herein, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min, and finally in 0.3X wash mix (alternatively, as in all final washes described herein, approximately, 0.2X, 0.4X, 0.6X, 0.8X, 1X, or any concentration between about 2X and about 6X can be used in conjunction with a suitable wash temperature) containing 0.1% SDS at 60°C (alternatively, approximately 42, 44, 46, 48, 50, 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min. The filters are then air dried and exposed to x-ray film for autoradiography. In yet another alternative protocol, washing of filters is done for 1.5 h at 55°C in a solution containing 2X SSC, 25mM Tris-HCl (pH 7.4), 5mM EDTA, and 0.1% SDS. The wash solution is replaced with fresh solution and incubated an additional 1.5 h at 60°C. Filters are then blotted dry and exposed for autoradiography. If necessary, filters are washed for a third time at 65-68°C and reexposed to

film. Other conditions of low stringency which may be used are well known in the art (*e.g.*, as employed for cross-species hybridizations). Preferably, GTS variants identified or isolated using the above methods will also encode a functionally equivalent gene product (*i.e.*, protein, polypeptide, or domain thereof, encoding or otherwise associated with a function or structure at least partially encoded by the complementary GTS).

Additional embodiments contemplated by the present invention include any polynucleotide sequence comprising a continuous stretch of nucleotide sequence originally disclosed in, or otherwise unique to, any of the GTSs of SEQ ID NOS:9-1008 that are at least 8, or at least 10, or at least 14, or at least 20, or at least 30, or at least about 40, and preferably at least about 60 consecutive nucleotides up to about several hundred bases of nucleotide sequence or an entire GTS sequence. Functional equivalents of the gene products of SEQ ID NOS:9-1008 include naturally occurring variants of SEQ ID NOS:9-1008 present in other species, and mutant variants, both naturally occurring and engineered, which retain at least some of the functional activities of the gene products of SEQ ID NOS:9-1008.

The invention also includes degenerate variants of the claimed GTS sequences, and products encoded thereby. Such variants may be 80% identical to any one of SEQ ID NOS: 9-1008, more preferably 85%, more preferably 90%, more preferably 95% and most preferably 98% identical. The degree of identity (or the degree of homology) of a polynucleotide sequence to any one of SEQ ID NOS: 9-1008 may be determined using any sequence analysis program known in the art, for example, the University of Wisconsin GCG sequence analysis package, SEQUENCHER 3.0, Gene Codes Corp., Ann Arbor, MI. The invention further includes GTS derivatives wherein any of the disclosed GTSs, or GTS variants, is linked to another polynucleotide molecule, or a fragment thereof, wherein the link may be either directly or through other polynucleotides of any sequence and of a length of about 1,000 base pairs, or about 500 base pairs, or about 300 base pairs, or about 200 base pairs, or about 150 base pairs, or about 100 base pairs or about 50 base pairs, or less.

The invention also particularly includes polynucleotide molecules, including DNA, that hybridize to, and are therefore the complements of, the nucleotide sequences of the disclosed GTSs. Such hybridization conditions may be highly stringent or less highly stringent, as described above. In instances wherein the nucleic acid molecules are

deoxyoligonucleotides ("DNA oligos"), highly stringent conditions may refer to, for example, washing in 6xSSC/0.05% sodium pyrophosphate at 37° C (for oligos having 14-base DNA oligos), 48° C (for 17-base DNA oligos), 55° C (for 20-base DNA oligos), and 60°C (for 23-base oligos). Similar conditions are contemplated for RNA oligos corresponding to a portion of the disclosed GTS sequences.

These nucleic acid molecules may encode or act as antisense molecules to polynucleotides comprising at least a portion of the sequences shown in SEQ ID NOS:9-1008 that are useful, for example, to regulate the expression of genes comprising a nucleotide sequence of any of SEQ ID NOS:9-1008, and can also be used, for example, as antisense primers in amplification reactions of gene sequences. With respect to gene regulation, such techniques can be used to regulate, for example, developmental processes by modulating the expression of genes in embryonic stem cells. Further, such sequences may be used as part of ribozyme and/or triple helix sequences that can be used to regulate gene expression. Still further, such molecules may be used as components of diagnostic methods whereby, for example, the presence of a particular allele, of a gene that contains any of the sequences of SEQ ID NOS:9-1008 may be detected. Of particular interest is the use of the disclosed GTSs to conduct analysis of single nucleotide polymorphisms (SNPs), and particularly coding region SNPs or "cSNPs", in the human genome, or as general or individual-specific forensic markers. When so applied, a collection of GTSs is obtained from an individual, and screened against a control database of cSNPs (or other genetic markers) that have previously been associated with disease, suitability or susceptibility (or sensitivity) to specific drugs or therapies, or virtually any other human trait that correlates with a given cSNP or genetic marker, or assortment thereof. In addition to disease/diagnostic testing, the described GTSs are also useful as genetic markers for the prenatal analysis of congenital traits or defects.

In addition to the nucleotide sequences described above, full length cDNA or gene sequences that contain any of SEQ ID NOS:9-1008 present in the same species and/or homologs of any of those genes present in other species can be identified and isolated by using molecular biological techniques known in the art.

In order to clone the full length cDNA sequence from any species encoding the cDNA corresponding to the entire messenger RNA or to clone variant or heterologous forms of the

molecule, labeled DNA probes made from nucleic acid fragments corresponding to any of the partial cDNA disclosed herein may be used to screen a cDNA library. For example, oligonucleotides corresponding to either the 5' or 3' terminus of the cDNA sequence may be used to obtain longer nucleotide sequences. Briefly, the library may be plated out to yield a maximum of about 30,000 pfu for each 150 mm plate. Approximately 40 plates may be screened. The plates are incubated at 37° C until the plaques reach a diameter of 0.25 mm or are just beginning to make contact with one another (3-8 hours). Nylon filters are placed onto the soft top agarose and after 60 seconds, the filters are peeled off and floated on a DNA denaturing solution consisting of 0.4N sodium hydroxide. The filters are then immersed in neutralizing solution consisting of 1 M Tris HCl, pH 7.5, before being allowed to air dry. The filters are prehybridized in casein hybridization buffer containing 10% dextran sulfate, 0.5 M NaCl, 50 mM Tris HCL, pH 7.5, 0.1% sodium pyrophosphate, 1% casein, 1% SDS, and denatured salmon sperm DNA at 0.5 mg/ml for 6 hours at 60° C. The radiolabelled probe is then denatured by heating to 95° C for 2 minutes and then added to the prehybridization solution containing the filters. The filters are hybridized at 60° C (alternatively, as in all hybridizations described herein, approximately 42, 44, 46, 48, 50. 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 16 hours. The filters are then washed in approximately 1X wash mix (10X wash mix contains 3M NaCl, 0.6M Tris base, and 0.02M EDTA, alternatively, as with all washes described herein, 2X, 3X, 4X, 5X, 6X wash mix, or more, can be used) twice for 5 minutes each at room temperature, then in 1X wash mix containing 1% SDS at 60° C (alternatively, as in all washes described herein, approximately 42, 44, 46, 48, 50. 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min, and finally in 0.3X wash mix (alternatively, as in all final washes described herein, approximately, 0.2X, 0.4X, 0.6X, 0.8X, 1X, or any concentration between about 2X and about 6X can be used in conjunction with a suitable wash temperature) containing 0.1% SDS at 60° C (alternatively, approximately 42, 44, 46, 48, 50. 52, 54, 56, 58, 62, 64, 66, 68, 70, or about 72 degrees or more can be used) for about 30 min. The filters are then air dried and exposed to x-ray film for autoradiography. After developing, the film is aligned with the filters to select a positive plaque. If a single, isolated positive plaque cannot be obtained, the agar plug containing the plaques will be

removed and placed in lambda dilution buffer containing 0.1M NaCl, 0.01M magnesium sulfate, 0.035M Tris HCl, pH 7.5, 0.01% gelatin. The phage may then be replated and rescreened to obtain single, well isolated positive plaques. Positive plaques may be isolated and the cDNA clones sequenced using primers based on the known cDNA sequence. This step may be repeated until a full length cDNA is obtained.

It may be necessary to screen multiple cDNA libraries from different sources/tissues to obtain a full length cDNA. In the event that it is difficult to identify cDNA clones encoding the complete 5' terminal coding region, an often encountered situation in cDNA cloning, the RACE (Rapid Amplification of cDNA Ends) technique may be used. RACE is a proven PCR-based strategy for amplifying the 5' end of incomplete cDNAs. 5'-RACE-Ready cDNA synthesized from human fetal liver containing a unique anchor sequence is commercially available (Clontech). To obtain the 5' end of the cDNA, PCR is carried out, for example, on 5'-RACE-Ready cDNA using the provided anchor primer and the 3' primer. A secondary PCR reaction is then carried out using the anchored primer and a nested 3' primer according to the manufacturer's instructions.

Once obtained, the full length cDNA sequence may be translated into amino acid sequence and examined for certain landmarks found in the amino acid sequences encoded by SEQ ID NOS:9-1008, or any structural similarities to these disclosed sequences.

The identification of homologs, heterologs, or paralogs of SEQ ID NOS:9-1008 in other, preferably related, species can be useful for developing additional animal model systems that are closely related to humans for purposes of drug discovery. Genes at other genetic loci within the genome that encode proteins which have extensive homology to one or more domains of the gene products encoded by SEQ ID NOS:9-1008 can also be identified via similar techniques. In the case of cDNA libraries, such screening techniques can identify clones derived from alternatively spliced transcripts in the same or different species.

Screening can be done using filter hybridization with duplicate filters. The labeled probe can contain at least 15-30 base pairs of the nucleotide sequence presented in SEQ ID NOS:9-1008. The hybridization washing conditions used should be of a lower stringency when the cDNA library is derived from an organism different from, or heterologous to, the type of organism from which the labeled sequence was derived. With respect to the cloning

of a mammalian homolog, heterolog, ortholog, or paralog, using probes derived from any of the sequences of SEQ ID NOS:9-1008, for example, hybridization can, for example, be performed at 65° C overnight in Church's buffer (7% SDS, 250 mM $NaHPO_4$, 2 mM EDTA, 1% BSA). Washes can be done with 2XSSC, 0.1% SDS at 65° C and then at 0.1XSSC, 0.1% SDS at 65° C.

Low stringency conditions are well known to those of skill in the art, and will vary predictably depending on the specific organisms from which the library and the labeled sequences are derived. For guidance regarding such conditions see, for example, Sambrook *et al.*, 1989, Molecular Cloning, A Laboratory Manual, Cold Springs Harbor Press, N.Y.; and Ausubel *et al.*, 1989, Current Protocols in Molecular Biology, Green Publishing Associates and Wiley Interscience, N.Y.

Alternatively, the labeled nucleotide probe of a sequence of any of SEQ ID NOS:9-1008 may be used to screen a genomic library derived from the organism of interest, again, using appropriately stringent conditions. The identification and characterization of human genomic clones is helpful for designing diagnostic tests and clinical protocols for treating disorders in human patients that are known or suspected to be linked to disease or other developmental or cell differentiation disorders and abnormalities. For example, sequences derived from regions adjacent to the intron/exon boundaries of the human gene can be used to design primers for use in amplification assays to detect mutations within the exons, introns, splice sites (*e.g.*, splice acceptor and/or donor sites), etc., that can be used in diagnostics.

Further, gene homologs can also be isolated from nucleic acid of the organism of interest by performing PCR using two oligonucleotide primers derived from SEQ ID NOS:9-1008 or two degenerate oligonucleotide primer pools designed on the basis of amino acid sequences within the gene products encoded by SEQ ID NOS:9-1008. The template for the reaction may be cDNA obtained by reverse transcription of mRNA prepared from, for example, human or non-human cell lines, cell types, or tissues, like, for example, ES cells from the organism of interest.

The PCR product may be subcloned or sequenced directly or subcloned and sequenced to ensure that the amplified sequences represent the sequences of the gene corresponding to the sequence of SEQ ID NOS:9-1008 of interest. The PCR fragment may

then be used to isolate a full length cDNA clone by a variety of methods. For example, the amplified fragment may be labeled and used to screen a cDNA library, such as a bacteriophage cDNA library. Alternatively, the labeled fragment may be used to isolate genomic clones via the screening of a genomic library.

PCR technology may also be utilized to isolate full length cDNA sequences. For example, RNA can be isolated using standard procedures from an appropriate cellular source (*i.e.*, one known, or suspected, to express the gene corresponding to the sequence of SEQ ID NOS:9-1008 of interest, such as, for example, ES cells). A reverse transcription reaction may be performed on the RNA using an oligonucleotide primer specific for the most 5' end of the amplified fragment for the priming of first strand synthesis. The resulting RNA/DNA hybrid may then be "tailed" with guanines, for example, using a standard terminal transferase reaction, the hybrid may be digested with RNase H, and second strand synthesis may then be primed with a poly-C primer. Thus, cDNA sequences upstream from the amplified fragment may easily be isolated. For a review of cloning strategies which may be used, see *e.g.*, Sambrook *et al.*, 1989, supra. Alternatively, cDNA or genomic libraries can be screened using 5' PCR primers that hybridize to vector sequences and 3' PCR primers specific to the gene of interest. Typically, such primers comprise oligonucleotide "priming" sequences first disclosed in, or otherwise unique to, one of the GTSs of SEQ ID NOS:9-1008.

The sequence of a gene corresponding to any of the sequences of SEQ ID NOS:9-1008 can also be used to isolate mutant alleles of that gene. Such mutant alleles may be isolated from individuals either known or suspected to have a genotype which contributes to the disease of interest or other symptoms of developmental and cell differentiation and/or proliferation disorders and abnormalities. Mutant alleles and mutant allele products may then be utilized in the therapeutic and diagnostic programs described below. Additionally, such sequences of any of the genes corresponding to SEQ ID NOS:9-1008 can be used to detect gene regulatory (*e.g.*, promoter or promoter/enchancer) defects which can affect development or cell differentiation.

A cDNA of a mutant gene corresponding to any of the sequences of SEQ ID NOS:9-1008 can be isolated as discussed above, or, for example, by using PCR. In this case, the first cDNA strand may be synthesized by hybridizing an oligo-dT oligonucleotide to mRNA

isolated from cells derived from an individual suspected of carrying a mutant gene corresponding to any of the sequences of SEQ ID NOS:9-1008 by extending the new strand with reverse transcriptase. The second strand of the cDNA is then synthesized using an oligonucleotide that hybridizes specifically to the 5' region of the normal gene. The amplified product can be directly sequenced or cloned into a suitable vector and subsequently subjected to DNA sequence analysis. By comparing the DNA sequence of the mutant allele to that of the normal allele, the mutation(s) responsible for the loss or alteration of function of the mutant gene product can be ascertained.

Alternatively, a genomic library can be constructed using DNA obtained from one or more individuals suspected of carrying, or known to carry, a mutant allele corresponding to any of SEQ ID NOS:9-1008. Corresponding mutant cDNA libraries can be also constructed using RNA from cell types known, or suspected, to express such mutant alleles. The corresponding normal gene, or any suitable fragment thereof, may then be labeled and used as a probe to identify the corresponding mutant allele in such libraries. Clones containing the mutant gene sequences may then be identified and analyzed by DNA sequence analysis. Additionally, a protein expression library can be constructed utilizing cDNA synthesized from, for example, RNA isolated from a cell type known, or suspected, to express a mutant allele corresponding to any of the sequences of SEQ ID NOS:9-1008 from an individual suspected of, carrying or known to carry, such a mutant allele. In this manner, gene products made by the putatively mutant cell type may be expressed and screened using standard antibody screening techniques in conjunction with antibodies raised against the corresponding normal gene product or a portion thereof, as described below in Section 5.4 (For screening techniques, see, for example, Harlow, E. and Lane, eds., 1988, "Antibodies: A Laboratory Manual", Cold Spring Harbor Press, Cold Spring Harbor.) Additionally, screening can be accomplished by screening with labeled fusion proteins. In cases where a mutation results in an expressed gene product with altered function (*e.g.*, as a result of a missense or a frame shift mutation), a polyclonal set of antibodies to the wild-type gene product are likely to cross-react with the mutant gene product. Library clones detected via their reaction with such labeled antibodies can be purified and subjected to sequence analysis according to methods well known to those of skill in the art.

The invention also encompasses nucleotide sequences that encode mutant isoforms of any of the amino acid sequences encoded by the GTSs of SEQ ID NOS:9-1008, peptide fragments thereof, truncated versions thereof, and fusion proteins including any of the above. Examples of such fusion proteins can include, but not limited to, an epitope tag which aids in purification or detection of the resulting fusion protein; or an enzyme, fluorescent protein, luminescent protein which can be used as a marker.

The present invention additionally encompasses (a) RNA or DNA vectors that contain any portion of SEQ ID NOS:9-1008 and/or their complements as well as any of the peptides or proteins encoded thereby; (b) DNA vectors that contain a cDNA that substantially spans the entire open reading frame corresponding to any of the sequences of SEQ ID NOS:9-1008 and/or their complements; (c) DNA expression vectors that have or contain any of the foregoing sequences, or a portion thereof, operatively associated with a (d) genetically engineered host cells that contain a cDNA that spans the entire open reading frame, or any portion thereof, corresponding to any of the sequences of SEQ ID NOS:9-1008 operatively associated with a regulatory element, generally recombinantly positioned either *in vivo* (such as in gene activation) or *in vitro* that directs the expression of the coding sequences in the host cell. As used herein, regulatory elements include, but are not limited to,inducible and non-inducible promoters, enhancers, operators and other elements known to those skilled in the art that drive and regulate expression. Such regulatory elements include, but are not limited to,the baculovirus promoter, cytomegalovirus hCMV immediate early gene promoter, the early or late promoters of SV40 adenovirus, the *lac* system, the *trp* system, the *TAC* system, the *TRC* system, the major operator and promoter regions of phage A, the control regions of fd coat protein, acid phosphatase promoters, phosphoglycerate kinase (PGK) and especially 3-phosphoglycerate kinase promoters, and yeast alpha mating factors.

An additional application of the described novel human polynucleotide sequences is their use in the molecular mutagenesis/evolution of proteins that are at least partially encoded by the described novel sequences using, for example, polynucleotide shuffling or related methodologies. Such approaches are described in U.S. Patents Nos. 5,830,721 and 5,837,458 which are herein incorporated by reference in their entirety.

5.2 PROTEINS AND POLYPEPTIDES ENCODED BY POLYNUCLEOTIDES EXPRESSED IN MODIFIED HUMAN CELLS

Peptides and proteins encoded by the open reading frame of mRNAs corresponding to SEQ ID NOS:9-1008, polypeptides and peptide fragments, mutated, truncated or deleted forms of those peptides and proteins, fusion proteins containing any of those peptides and proteins can be prepared for a variety of uses, including, but not limited to, the generation of antibodies, as reagents in diagnostic assays, the identification of other cellular gene products involved in the regulation of development and cellular differentiation of various cell types, like, for example, ES cells, as reagents in assays for screening for compounds that can be used in the treatment of disorders affecting development and cell differentiation, and as pharmaceutical reagents useful in the treatment of disorders affecting development and cell differentiation.

The invention also encompasses proteins, peptides, and polypeptides that are functionally equivalent to those encoded by SEQ ID NOS:9-1008. Such functionally equivalent products include, but are not limited to, additions or substitutions of amino acid residues within the amino acid sequence encoded by the nucleotide sequences described above, but which result in a silent change, thus producing a functionally equivalent gene product. Amino acid substitutions can be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity, and/or the amphipathic nature of the residues involved. For example, nonpolar (hydrophobic) amino acids include alanine, leucine, isoleucine, valine, proline, phenylalanine, tryptophan, and methionine; polar neutral amino acids include glycine, serine, threonine, cysteine, tyrosine, asparagine, and glutamine; positively charged (basic) amino acids include arginine, lysine, and histidine; and negatively charged (acidic) amino acids include aspartic acid and glutamic acid.

While random mutations can be introduced into DNA encoding peptides and proteins of the current invention (using random mutagenesis techniques well known to those skilled in the art), and the resulting mutant peptides and proteins tested for activity, site-directed mutations of the coding sequence can be engineered (using standard site-directed mutagenesis techniques) to generate mutant peptides and proteins of the current invention having increased functionality.

For example, the amino acid sequence of peptides and proteins of the current invention can be aligned with homologs from different species. Mutant peptides and proteins can be engineered so that regions of interspecies identity are maintained, whereas the variable residues are altered, *e.g.*, by deletion or insertion of an amino acid residue(s) or by substitution of one or more different amino acid residues. Conservative alterations at the variable positions can be engineered in order to produce a mutant form of a peptide or protein of the current invention that retains function. Non-conservative changes can be engineered at these variable positions to alter function. Alternatively, where alteration of function is desired, deletion or non-conservative alterations of the conserved regions can be engineered. One of skill in the art may easily test such mutant or deleted form of a peptide or protein of the current invention for these alterations in function using the teachings presented herein.

Other mutations to the coding sequences described above can be made to generate peptides and proteins that are better suited for expression, scale up, etc. in the host cells chosen. For example, the triplet code for each amino acid can be modified to conform more closely to the preferential codon usage of the host cell's translational machinery, or, for example, to yield a messenger RNA molecule with a longer half-life. Those skilled in the art would readily know what modifications of the nucleotide sequence would be desirable to conform the nucleotide sequence to preferential codon usage or to make the messenger RNA more stable. Such information would be obtainable, for example, through use of computer programs, through review of available research data on codon usage and messenger RNA stability, and through other means known to those of skill in the art.

Peptides corresponding to one or more domains (or a portion of a domain) of one of the proteins described above, truncated or deleted proteins, as well as fusion proteins in which the full length protein described above, a subunit peptide or truncated version is fused to an unrelated protein are also within the scope of the invention and can be designed by those of skill in the art on the basis of experimental or functional considerations. Such fusion proteins include, but are not limited to, fusions to an epitope tag; or fusions to an enzyme, fluorescent protein, or luminescent protein which provide a marker function.

While the peptides and proteins of the current invention can be chemically synthesized (*e.g.*, see Creighton, 1983, Proteins: Structures and Molecular Principles, W.H.

Freeman & Co., N.Y.), large polypeptides derived from any of the polynucleotides described above may advantageously be produced by recombinant DNA technology using techniques well known in the art for expressing genes and/or coding sequences. These methods include, for example, *in vitro* recombinant DNA techniques, synthetic techniques, and *in vivo* genetic recombination. See, for example, the techniques described in Sambrook *et al.*, 1989, *supra*, and Ausubel *et al.*, 1989, *supra*. Alternatively, RNA capable of encoding any of the nucleotide sequences described above may be chemically synthesized using, for example, synthesizers. See, for example, the techniques described in "Oligonucleotide Synthesis", 1984, Gait, M.J. ed., IRL Press, Oxford, which is incorporated by reference herein in its entirety.

A variety of host-expression vector systems may be utilized to express the nucleotide sequences of the invention. Where the peptide or protein to be synthesized is a soluble derivative, the peptide or polypeptide can be recovered from the culture, *i.e.*, from the host cell in cases where the peptide or polypeptide is not secreted, and from the culture media in cases where the peptide or polypeptide is secreted by the cells. However, such engineered host cells themselves may be used in situations where it is important not only to retain the structural and functional characteristics of the expressed peptide or protein, but to assess biological activity, *e.g.*, in drug screening assays.

The expression systems that may be used for purposes of the invention include, but are not limited to, microorganisms such as bacteria (*e.g.*, *E. coli*, *B. subtilis*) transformed with recombinant bacteriophage DNA, plasmid DNA or cosmid DNA expression vectors containing a nucleotide sequence of the current invention; yeast (*e.g.*, *Saccharomyces*, *Pichia*) transformed with recombinant yeast expression vectors containing a nucleotide sequence of the current invention; insect cell systems infected with recombinant virus expression vectors (*e.g.*, baculovirus) containing a nucleotide sequence of the current invention; plant cell systems infected with recombinant virus expression vectors (*e.g.*, cauliflower mosaic virus, CaMV; tobacco mosaic virus, TMV) or transformed with recombinant plasmid expression vectors (*e.g.*, Ti plasmid) containing a nucleotide sequence of the current invention; or mammalian cell systems (*e.g.*, COS, CHO, BHK, 293, 3T3, U937) harboring recombinant expression constructs containing promoters derived from the genome of

mammalian cells (*e.g.*, metallothionein promoter) or from mammalian viruses (*e.g.*, the adenovirus late promoter; the vaccinia virus 7.5K promoter).

In bacterial systems, a number of expression vectors may be advantageously selected depending upon the use intended for the gene product being expressed. For example, when large quantities of such a protein are to be produced for the generation of pharmaceutical compositions of a protein or for raising antibodies to the protein to be expressed, for example, vectors which direct the expression of high levels of fusion protein products that are readily purified may be desirable. Such vectors include, but are not limited to, the *E. coli* expression vector pUR278 (Ruther *et al.*, 1983, EMBO J. *2*:1791), in which the coding sequence of the polynucleotide to be expressed may be ligated individually into the vector in frame with the *lacZ* coding region so that a fusion protein is produced; pIN vectors (Inouye & Inouye, 1985, Nucleic Acids Res. *13*:3101-3109; Van Heeke & Schuster, 1989, J. Biol. Chem. *264*:5503-5509); and the like. pGEX vectors may also be used to express foreign polypeptides as fusion proteins with glutathione S-transferase (GST). If the inserted sequence encodes a relatively small polypeptide (less than 25 kD), such fusion proteins are generally soluble and can easily be purified from lysed cells by adsorption to glutathione-agarose beads followed by elution in the presence of free glutathione. The pGEX vectors are designed to include thrombin or factor Xa protease cleavage sites so that the cloned target gene product can be released from the GST moiety. Alternatively, if the resulting fusion protein is insoluble and forms inclusion bodies in the host cell, the inclusion bodies may be purified and the recombinant protein solubilized using techniques well known to one of skill in the art.

In an insect system, *Autographa californica* nuclear polyhidrosis virus (AcNPV) may be used as a vector to express foreign genes. (*e.g.*, see Smith *et al.*, 1983, J. Virol. *46*: 584; Smith, U.S. Patent No. 4,215,051). In one embodiment of the current invention, Sf9 insect cells are infected with a baculovirus vector expressing a peptide or protein of the current invention.

In mammalian host cells, a number of viral-based expression systems may be utilized. Specific embodiments (described more fully below) include the gene trap cDNA sequences of the current invention that are expressed by a CMV promoter to transiently express recombinant protein in U937 cells or in Cos-7 cells. Alternatively, retroviral vector systems

well known in the art may be used to insert the recombinant expression construct into host cells, or vaccinia virus-based expression systems may be employed.

In yeast, a number of vectors containing constitutive or inducible promoters may be used. For a review, see Current Protocols in Molecular Biology, Vol. 2, 1988, Ed. Ausubel *et al.*, Greene Publish. Assoc. & Wiley Interscience, Ch. 13; Grant *et al.*, 1987, Expression and Secretion Vectors for Yeast, in Methods in Enzymology, Eds. Wu & Grossman, 1987, Acad. Press, N.Y., Vol. 153, pp. 516-544; Glover, 1986, DNA Cloning, Vol. II, IRL Press, Wash., D.C., Ch. 3; and Bitter, 1987, Heterologous Gene Expression in Yeast, Methods in Enzymology, Eds. Berger & Kimmel, Acad. Press, N.Y., Vol. 152, pp. 673-684; and The Molecular Biology of the Yeast Saccharomyces, 1982, Eds. Strathern *et al.*, Cold Spring Harbor Press, Vols. I and II.

In cases where plant expression vectors are used, the expression of the coding sequence may be driven by any of a number of promoters. For example, viral promoters such as the 35S RNA and 19S RNA promoters of CaMV (Brisson *et al.*, 1984, Nature, *310*:511-514), or the coat protein promoter of TMV (Takamatsu *et al.*, 1987, EMBO J. *6*:307-311) may be used; alternatively, plant promoters such as the small subunit of RUBISCO (Coruzzi *et al.*, 1984, EMBO J. *3*:1671-1680; Broglie *et al.*, 1984, Science *224*:838-843); or heat shock promoters, *e.g.*, soybean hsp17.5-E or hsp17.3-B (Gurley *et al.*, 1986, Mol. Cell. Biol. 6:559-565) may be used. These constructs can be introduced into plant cells using Ti plasmids, Ri plasmids, plant virus vectors, direct DNA transformation, microinjection, electroporation, etc. For reviews of such techniques see, for example, Weissbach & Weissbach, 1988, Methods for Plant Molecular Biology, Academic Press, NY, Section VIII, pp. 421-463; and Grierson & Corey, 1988, Plant Molecular Biology, 2d Ed., Blackie, London, Ch. 7-9.

In cases where an adenovirus is used as an expression vector, the nucleotide sequence of interest may be ligated to an adenovirus transcription/translation control complex, *e.g.*, the late promoter and tripartite leader sequence. This chimeric gene may then be inserted in the adenovirus genome by *in vitro* or *in vivo* recombination. Insertion in a non-essential region of the viral genome (*e.g.*, region E1 or E3) will result in a recombinant virus that is viable and capable of expressing the gene product of interest in infected hosts. (*e.g.*, See Logan & Shenk, 1984, Proc. Natl. Acad. Sci. USA *81*:3655-3659). Specific initiation signals may also

be required for efficient translation of inserted nucleotide sequences of interest. These signals include the ATG initiation codon and adjacent sequences. In cases where an entire gene or cDNA, including its own initiation codon and adjacent sequences, is inserted into the appropriate expression vector, no additional translational control signals may be needed. However, in cases where only a portion of a coding sequence of interest is inserted, exogenous translational control signals, including, perhaps, the ATG initiation codon, must be provided. Furthermore, the initiation codon must be in phase with the reading frame of the desired coding sequence to ensure translation of the entire insert. These exogenous translational control signals and initiation codons can be of a variety of origins, both natural and synthetic. The efficiency of expression may be enhanced by the inclusion of appropriate transcription enchanter elements, transcription terminators, etc. (See Bittner *et al.*, 1987, Methods in Enzymol. *153*:516-544).

In addition, a host cell strain may be chosen which modulates the expression of the inserted sequences, or modifies and processes the gene product in the specific fashion desired. Such modifications (*e.g.*, glycosylation) and processing (*e.g.*, cleavage) of protein products may be important for the function of the protein. Different host cells have characteristic and specific mechanisms for the post-translational processing and modification of proteins and gene products. Appropriate cell lines or host systems can be chosen to ensure the correct modification and processing of the foreign protein expressed. To this end, eukaryotic host cells which possess the cellular machinery for proper processing of the primary transcript may be used. Such mammalian host cells include, but are not limited to,CHO, VERO, BHK, HeLa, COS, MDCK, 293, 3T3, WI38, and U937 cells.

For long-term, high-yield production of recombinant proteins, stable expression is preferred. For example, cell lines which stably express the sequences of interest described above may be engineered. Rather than using expression vectors which contain viral origins of replication, host cells can be transformed with DNA controlled by appropriate expression control elements (*e.g.*, promoter, enchanter sequences, transcription terminators, polyadenylation sites, etc.), and a selectable marker. Following the introduction of the foreign DNA, engineered cells may be allowed to grow for 1-2 days in an enriched media, and then are switched to a selective media. The selectable marker in the recombinant plasmid

confers resistance to the selection and allows cells to stably integrate the plasmid into their chromosomes and grow to form foci which in turn can be cloned and expanded into cell lines. This method may advantageously be used to engineer cell lines which express the gene product of interest. Such engineered cell lines may be particularly useful in screening and evaluation of compounds that affect the endogenous activity of the gene product of interest.

A number of selection systems may be used, including but not limited to the herpes simplex virus thymidine kinase (Wigler *et al.*, 1977, Cell *11*:223), hypoxanthine-guanine phosphoribosyltransferase (Szybalska & Szybalski, 1962, Proc. Natl. Acad. Sci. USA *48*:2026), and adenine phosphoribosyltransferase (Lowy *et al.*, 1980, Cell *22*:817) genes can be employed in tk^-, $hgprt^-$ or $aprt^-$ cells, respectively. Also, antimetabolite resistance can be used as the basis of selection for the following genes: dhfr, which confers resistance to methotrexate (Wigler *et al.*, 1980, Natl. Acad. Sci. USA *77*:3567; O'Hare *et al.*, 1981, Proc. Natl. Acad. Sci. USA *78*:1527); gpt, which confers resistance to mycophenolic acid (Mulligan & Berg, 1981, Proc. Natl. Acad. Sci. USA *78*:2072); neo, which confers resistance to the aminoglycoside G-418 (Colberre-Garapin *et al.*, 1981, J. Mol. Biol. *150*:1); and hygro, which confers resistance to hygromycin (Santerre *et al.*, 1984, Gene *30*:147).

The gene products of interest can also be expressed in transgenic animals. Animals of any species, including, but not limited to, mice, rats, rabbits, guinea pigs, pigs, micro-pigs, goats, and non-human primates, *e.g.*, baboons, monkeys, and chimpanzees may be used to generate transgenic animals carrying the polynucleotide of interest of the current invention.

Any technique known in the art may be used to introduce the transgene of interest into animals to produce the founder lines of transgenic animals. Such techniques include, but are not limited to pronuclear microinjection (Hoppe, P.C. and Wagner, T.E., 1989, U.S. Pat. No. 4,873,191); retrovirus mediated gene transfer into germ lines (Van der Putten *et al.*, 1985, Proc. Natl. Acad. Sci., USA *82*:6148-6152); gene targeting in embryonic stem cells (Thompson *et al.*, 1989, Cell *56*:313-321); electroporation of embryos (Lo, 1983, Mol Cell. Biol. *3*:1803-1814); sperm-mediated gene transfer (Lavitrano *et al.*, 1989, Cell *57*:717-723); positive-negative selection as described in U.S. Patent No. 5,464,764 herein incorporated by reference. For a review of such techniques, see Gordon, 1989, Transgenic Animals, Intl. Rev. Cytol. *115*:171-229, which is incorporated by reference herein in its entirety.

The present invention provides for transgenic animals that carry the transgene of interest in all their cells, as well as animals which carry the transgene in some, but not all their cells, *i.e.*, mosaic animals. The transgene may be integrated as a single transgene or in concatamers, *e.g.*, head-to-head tandems or head-to-tail tandems. The transgene may also be selectively introduced into and activated in a particular cell type by following, for example, the teaching of Lasko *et al.* (Lasko, M. *et al.*, 1992, Proc. Natl. Acad. Sci. USA *89*:6232-6236). The regulatory sequences required for such a cell-type specific activation will depend upon the particular cell type of interest, and will be apparent to those of skill in the art. When it is desired that the transgene of interest be integrated into the chromosomal site of the endogenous copy of that same gene, gene targeting is preferred. Briefly, when such a technique is to be utilized, vectors containing some nucleotide sequences homologous to the endogenous gene of interest are designed for the purpose of integrating, via homologous recombination with chromosomal sequences, into and disrupting the function of the nucleotide sequence of the endogenous gene of interest. In this way, the expression of the endogenous gene may also be eliminated by inserting non-functional sequences into the endogenous gene. The transgene may also be selectively introduced into a particular cell type, thus inactivating the endogenous gene of interest in only that cell type, by following, for example, the teaching of Gu *et al.* (Gu *et al.*, 1994, Science *265*: 103-106). The regulatory sequences required for such a cell-type specific inactivation will depend upon the particular cell type of interest and will be apparent to those of skill in the art.

Once transgenic animals have been generated, the expression of the recombinant gene of interest may be assayed utilizing standard techniques. Initial screening may be accomplished by Southern blot analysis or PCR techniques to analyze animal tissues to assay whether integration of the transgene has taken place. The level of mRNA expression of the transgene in the tissues of the transgenic animals may also be assessed using techniques which include, but are not limited to, Northern blot analysis of cell type samples obtained from the animal, *in situ* hybridization analysis, and RT-PCR. Samples of gene-expressing tissue, may also be evaluated immunocytochemically using antibodies specific for the transgene product, as described below.

5.3 CELLS THAT CONTAIN A DISRUPTED ALLELE OF A GENE ENCODING A POLYNUCLEOTIDE OF THE CURRENT INVENTION

Another aspect of the current invention are cells which contain a gene that encodes a polynucleotide of the current invention and that has been disrupted. Those of skill in the art would know how to disrupt a gene in a cell using techniques known in the art. Also, techniques useful to disrupt a gene in a cell and especially an ES cell, that may already be disrupted, as disclosed in copending US patent applications Nos. 08/726,867; 08/728,963; 08/907,598; and 08/942,806, all of which are hereby incorporated herein by reference in their entirety, are within the scope of the current invention to disrupt a gene that encodes a polynucleotide of the current invention.

5.3.1 IDENTIFICATION OF CELLS THAT EXPRESS GENES ENCODING POLYNUCLEOTIDES OF THE CURRENT INVENTION

Host cells that contain coding sequence and/or express a biologically active gene product, or fragment thereof, encoded by a gene corresponding to a GTS present invention may be identified by at least four general approaches; (a) DNA-DNA or DNA-RNA hybridization; (b) the presence or absence of "marker" gene functions; (c) assessing the level of transcription as measured by the expression of mRNA transcripts in the host cell; and (d) detection of the gene product as measured by immunoassay, enzymatic assay, chemical assay, or by its biological activity. Prior to screening for gene expression, the host cells can first be treated in an effort to increase the level of expression of genes encoding polynucleotides of the current invention, especially in cell lines that produce low amounts of the mRNAs and/or peptides and proteins of the current invention.

In the first approach, the presence of the coding sequence for peptides and proteins of the current invention inserted in the expression vector can be detected by DNA-DNA or DNA-RNA hybridization using probes comprising nucleotide sequences that are homologous to the coding sequence for peptides and proteins of the current invention, respectively, or portions or derivatives thereof.

In the second approach, the recombinant expression vector/host system can be identified and selected based upon the presence or absence of certain "marker" gene functions

(*e.g.*, thymidine kinase activity, resistance to antibiotics, resistance to methotrexate, transformation phenotype, occlusion body formation in baculovirus, etc.). For example, if the coding sequence for the peptide or protein of the current invention is inserted within a marker gene sequence of the vector, recombinants containing the coding sequence for the peptide or protein of the current invention can be identified by the absence of the marker gene function. Alternatively, a marker gene can be placed in tandem with the sequence for the peptide or protein of the current invention under the control of the same or different promoter used to control the expression of the coding sequence for the peptide or protein of the current invention. Expression of the marker in response to induction or selection indicates expression of the coding sequence for the peptide or protein of the current invention.

In the third approach, transcriptional activity for the coding region of genes specific for peptides and proteins of the current invention can be assessed by hybridization assays. For example, RNA can be isolated and analyzed by Northern blot using a probe derived from a GTS, or any portion thereof. Alternatively, total nucleic acids of the host cell may be extracted and assayed for hybridization to such probes. Additionally, RT-PCR (using GTS specific oligos/products) may be used to detect low levels of gene expression in a sample, or in RNA isolated from a spectrum of different tissues, or PCR can be used can be used to screen a variety of cDNA libraries derived from different tissues to determine which tissues express a given GTS.

In the fourth approach, the expression of the peptides and proteins of the current invention can be assessed immunologically, for example by Western blots, immunoassays such as radioimmuno-precipitation, enzyme-linked immunoassays and the like. This can be achieved by using an antibody and a binding partner specific to a peptide or protein of the current invention.

5.4 <u>ANTIBODIES TO PROTEINS OF THE CURRENT INVENTION</u>

Antibodies that specifically recognize one or more epitopes of a peptide or protein of the current invention, or epitopes of conserved variants of a peptide or protein at least partially encoded by a GTS of the present invention, or any and all peptide fragments thereof, are also encompassed by the invention. Such antibodies include, but are not limited

to,polyclonal antibodies, monoclonal antibodies (mAbs), humanized or chimeric antibodies, single chain antibodies, Fab fragments, $F(ab')_2$ fragments, fragments produced by a Fab expression library, anti-idiotypic (anti-Id) antibodies, and epitope-binding fragments of any of the above.

The antibodies of the invention may be used, for example, in the detection of the peptide or protein of interest of the current invention in a biological sample and may, therefore, be utilized as part of a diagnostic or prognostic technique whereby patients may be tested for abnormal amounts of these proteins. Such antibodies may also be utilized in conjunction with, for example, compound screening schemes as described, below in Section 5.6 for the evaluation of the effect of test compounds on expression and/or activity of the gene products of interest of the current invention. Additionally, such antibodies can be used in conjunction with the gene therapy and gene delivery techniques described below to, for example, evaluate the normal and/or engineered peptide- or protein-expressing cells prior to their introduction into the patient. Such antibodies may additionally be used as a method for inhibiting the abnormal activity of a peptide or protein of interest at least partially encoded by a GTS of the present invention. Thus, such antibodies may, for example, be utilized as part of treatment methods for development and cell differentiation disorders.

For the production of antibodies, various host animals may be immunized by injection with the peptide or protein of interest, a subunit peptide of such protein, a truncated polypeptide, functional equivalents of the peptide or protein, mutants of the peptide or protein, or denatured forms of the above. Such host animals may include, but are not limited to,rabbits, mice, and rats, to name but a few. Various adjuvants can be used to increase the immunological response, depending on the host species, including but not limited to Freund's (complete and incomplete), mineral gels such as aluminum hydroxide, surface active substances such as lysolecithin, pluronic polyols, polyanions, peptides, oil emulsions, keyhole limpet hemocyanin, dinitrophenol, and potentially useful human adjutants such as BCG (bacille Calmette-Guerin) and *Corynebacterium parvum*. Polyclonal antibodies are heterogeneous populations of antibody molecules derived from the sera of the immunized animals.

Monoclonal antibodies, which are homogeneous populations of antibodies to a particular antigen, may be obtained by any technique which provides for the production of antibody molecules by continuous cell lines in culture. These include, but are not limited to, the hybridoma technique of Kohler and Milstein, (1975, Nature *256*:495-497; and U.S. Patent No. 4,376,110), the human B-cell hybridoma technique (Kosbor *et al.*, 1983, Immunology Today *4*:72; Cole *et al.*, 1983, Proc. Natl. Acad. Sci. USA *80*:2026-2030), and the EBV-hybridoma technique (Cole *et al.*, 1985, Monoclonal Antibodies And Cancer Therapy, Alan R. Liss, Inc., pp. 77-96). Such antibodies may be of any immunoglobulin class including IgG, IgM, IgE, IgA, IgD and any subclass thereof. The hybridoma producing the mAb of this invention may be cultivated *in vitro* or *in vivo*. Production of high titers of mAbs *in vivo* makes this the presently preferred method of production.

In addition, techniques developed for the production of "chimeric antibodies" (Morrison *et al.*, 1984, Proc. Natl. Acad. Sci. USA, *81*:6851-6855; Neuberger *et al.*, 1984, Nature, *312*:604-608; Takeda *et al.*, 1985, Nature, *314*:452-454) by splicing the genes from a mouse antibody molecule of appropriate antigen specificity together with genes from a human antibody molecule of appropriate biological activity can be used. A chimeric antibody is a molecule in which different portions are derived from different animal species, such as those having a variable region derived from a porcine mAb and a human immunoglobulin constant region.

Alternatively, techniques described for the production of single chain antibodies (U.S. Patent 4,946,778; Bird, 1988, Science *242*:423-426; Huston *et al.*, 1988, Proc. Natl. Acad. Sci. USA *85*:5879-5883; and Ward *et al.*, 1989, Nature *334*:544-546) can be adapted to produce single chain antibodies against gene products of interest. Single chain antibodies are formed by linking the heavy and light chain fragments of the Fv region via an amino acid bridge, resulting in a single chain polypeptide.

Antibody fragments which recognize specific epitopes may be generated by known techniques. For example, such fragments include, but are not limited to: the $F(ab')_2$ fragments which can be produced by pepsin digestion of the antibody molecule and the Fab fragments which can be generated by reducing the disulfide bridges of the $F(ab')_2$ fragments. Alternatively, Fab expression libraries may be constructed (Huse *et al.*, 1989, Science,

246:1275-1281) to allow rapid and easy identification of monoclonal Fab fragments with the desired specificity.

Antibodies to peptides and proteins that are fully or at least partially encoded by the described GTSs, or fragments or truncated versions thereof, can in turn be utilized to generate anti-idiotypic antibodies that "mimic" an epitope of the peptide or protein of interest, using techniques well known to those skilled in the art. (See, *e.g.*, Greenspan & Bona, 1993, FASEB J *7(5)*:437-444; and Nissinoff, 1991, J. Immunol. *147(8)*:2429-2438). For example antibodies that bind to a regulatory peptide or protein of interest of the current invention and competitively inhibit the binding of such peptide or protein to any of its binding partners in the cell can be used to generate anti-idiotypes that "mimic" the peptide or protein of interest and, therefore, bind and neutralize the particular binding partner of the peptide or protein of interest. Such neutralizing antibodies, anti-idiotypes, Fab fragments of such antibodies, or humanized derivatives thereof, can be used in therapeutic regimens to mimic or neutralize (depending on the antibody) the effect of a particular peptide of interest, or a binding partner of a peptide or protein of interest.

5.5 DIAGNOSIS OF DISORDERS AFFECTING DEVELOPMENT AND CELL DIFFERENTIATION

A variety of methods can be employed for the diagnostic and prognostic evaluation of disorders involving developmental and differentiation processes, and for the identification of subjects having a predisposition to such disorders.

Such methods may, for example, utilize reagents such as the nucleotide sequences described above, and antibodies to peptides and proteins of the current invention, as described, in Section 5.4. Specifically, such reagents may be used, for example, for: (1) the detection of the presence of gene mutations, or the detection of either over- or under-expression of the respective mRNAs relative to the non-disorder state; (2) the detection of either an over- or an under-abundance of the respective gene product relative to the non-disorder state; and (3) the detection of perturbations or abnormalities in the intra- and inter-cellular processes mediated by the respective peptides or proteins of the current invention.

The methods described herein may be performed, for example, by utilizing pre-packaged diagnostic kits comprising at least one specific nucleotide sequence of the current invention or antibody reagent described herein, which may be conveniently used, *e.g.*, in clinical settings, to diagnose patients exhibiting developmental or cell differentiation disorder abnormalities.

For the detection of mutations in any of the genes described above, any nucleated cell can be used as a starting source for genomic nucleic acid. For the detection of gene expression or gene products, any cell type or tissue in which the gene of interest is expressed, such as, for example, ES cells, may be utilized. Specific examples of cells and tissues that can be analyzed using the claimed polynucleotides include, but are not limited to, endothelial cells, epithelial cells, islets, neurons or neural tissue, mesothelial cells, osteocytes, lymphocytes, chondrocytes, hematopoietic cells, immune cells, cells of the major glands or organs (e.g., lung, heart, stomach, pancreas, kidney, skin, etc.), exocrine and/or endocrine cells, embryonic and other stem cells, fibroblasts, and culture adapted and/or transformed versions of the above. Diseases or natural processes that can also be correlated with the expression of mutant, or normal, variants of the disclosed GTSs include, but are not limited to, aging, cancer, autoimmune disease, lupus, scleroderma, Crohn's disease, multiple sclerosis, inflammatory bowel disease, immune disorders, schizophrenia, psychosis, alopecia, glandular disorders, inflammatory disorders, ataxia telangiectasia, diabetes, skin disorders such as acne, eczema, and the like, osteo and rheumatoid arthritis, high blood pressure, atherosclerosis, cardiovascular disease, pulmonary disease, degenerative diseases of the neural or skeletal systems, Alzheimer's disease, Parkinson's disease, osteoporosis, asthma, developmental disorders or abnormalities, genetic birth defects, infertility, epithelial ulcerations, and viral, parasitic, fungal, yeast, or bacterial infection.

Primary, secondary, or culture-adapted variants of cancer cells/tissues can also be analyzed using the claimed polynucleotides. Examples of such cancers include, but are not limited to, Cardiac: sarcoma (angiosarcoma, fibrosarcoma, rhabdomyosarcoma, liposarcoma), myxoma, rhabdomyoma, fibroma, lipoma and teratoma; Lung: bronchogenic carcinoma (squamous cell, undifferentiated small cell, undifferentiated large cell, adenocarcinoma), alveolar (bronchiolar) carcinoma, bronchial adenoma, sarcoma, lymphoma, chondromatous

hamartoma, mesothelioma; Gastrointestinal: esophagus (squamous cell carcinoma, adenocarcinoma, leiomyosarcoma, lymphoma), stomach (carcinoma, lymphoma, leiomyosarcoma), pancreas (ductal adenocarcinoma, insulinoma, glucagonoma, gastrinoma, carcinoid tumors, vipoma), small bowel (adenocarcinoma, lymphoma, carcinoid tumors, Karposi's sarcoma, leiomyoma, hemangioma, lipoma, neurofibroma, fibroma), large bowel (adenocarcinoma, tubular adenoma, villous adenoma, hamartoma, leiomyoma); Genitourinary tract: kidney (adenocarcinoma, Wilm's tumor [nephroblastoma], lymphoma, leukemia), bladder and urethra (squamous cell carcinoma, transitional cell carcinoma, adenocarcinoma), prostate (adenocarcinoma, sarcoma), testis (seminoma, teratoma, embryonal carcinoma, teratocarcinoma, choriocarcinoma, sarcoma, interstitial cell carcinoma, fibroma, fibroadenoma, adenomatoid tumors, lipoma); Liver: hepatoma (hepatocellular carcinoma), cholangiocarcinoma, hepatoblastoma, angiosarcoma, hepatocellular adenoma, hemangioma; Bone: osteogenic sarcoma (osteosarcoma), fibrosarcoma, malignant fibrous histiocytoma, chondrosarcoma, Ewing's sarcoma, malignant lymphoma (reticulum cell sarcoma), multiple myeloma, malignant giant cell tumor, chordoma, osteochronfroma (osteocartilaginous exostoses), benign chondroma, chondroblastoma, chondromyxofibroma, osteoid osteoma and giant cell tumors; Nervous system: skull (osteoma, hemangioma, granuloma, xanthoma, osteitis deformans), meninges (meningioma, meningiosarcoma, gliomatosis), brain (astrocytoma, medulloblastoma, glioma, ependymoma, germinoma [pinealoma], glioblastoma multiforme, oligodendroglioma, schwannoma, retinoblastoma, congenital tumors), spinal cord (neurofibroma, meningioma, glioma, sarcoma); Gynecological: uterus (endometrial carcinoma), cervix (cervical carcinoma, pre-tumor cervical dysplasia), ovaries (ovarian carcinoma [serous cystadenocarcinoma, mucinous cystadenocarcinoma, endometrioid tumors, celioblastoma, clear cell carcinoma, unclassified carcinoma], granulosa-thecal cell tumors, Sertoli-Leydig cell tumors, dysgerminoma, malignant teratoma), vulva (squamous cell carcinoma, intraepithelial carcinoma, adenocarcinoma, fibrosarcoma, melanoma), vagina (clear cell carcinoma, squamous cell carcinoma, botryoid sarcoma [embryonal rhabdomyosarcoma], fallopian tubes (carcinoma); Hematologic: blood (myeloid leukemia [acute and chronic], acute lymphoblastic leukemia, chronic lymphocytic leukemia, myeloproliferative diseases, multiple myeloma, myelodysplastic syndrome), Hodgkin's

disease, non-Hodgkin's lymphoma [malignant lymphoma]; Skin: malignant melanoma, basal cell carcinoma, squamous cell carcinoma, Karposi's sarcoma, moles, dysplastic nevi, lipoma, angioma, dermatofibroma, keloids, psoriasis; Breast: carcinoma and sarcoma, and Adrenal glands: neuroblastoma.

Nucleic acid-based detection techniques and peptide detection techniques that can be used to conduct the above analyses are described below.

5.5.1. DETECTION OF THE GENES OF THE CURRENT INVENTION AND THEIR RESPECTIVE TRANSCRIPTS

Mutations within the genes of the current invention can be detected by utilizing a number of techniques. Nucleic acid from any nucleated cell can be used as the starting point for such assay techniques, and may be isolated according to standard nucleic acid preparation procedures which are well known to those of skill in the art.

DNA may be used in hybridization or amplification assays of biological samples to detect abnormalities involving gene structure, including point mutations, insertions, deletions and chromosomal rearrangements. Such assays may include, but are not limited to, Southern analyses, single stranded conformational polymorphism analyses (SSCP), and PCR analyses.

Such diagnostic methods for the detection of gene-specific mutations can involve for example, contacting and incubating nucleic acids including recombinant DNA molecules, cloned genes or degenerate variants thereof, obtained from a sample, *e.g.*, derived from a patient sample or other appropriate cellular source, with one or more labeled nucleic acid reagents including recombinant DNA molecules, cloned genes or degenerate variants thereof, as described above, under conditions favorable for the specific annealing of these reagents to their complementary sequences within the gene of interest of the current invention. Preferably, the lengths of these nucleic acid reagents are at least 15 to 30 nucleotides. After incubation, all non-annealed nucleic acids are removed from the nucleic acid molecule hybrid. The presence of nucleic acids which have hybridized, if any such molecules exist, is then detected. Using such a detection scheme, the nucleic acid from the cell type or tissue of interest can be immobilized, for example, to a solid support such as a membrane, or a plastic surface such as that on a microtiter plate or polystyrene beads. In this case, after incubation,

non-annealed, labeled nucleic acid reagents of the type described above are easily removed. Detection of the remaining, annealed, labeled nucleic acid reagents is accomplished using standard techniques well-known to those in the art. The gene sequences to which the nucleic acid reagents have annealed can be compared to the annealing pattern expected from a normal gene sequence in order to determine whether a gene mutation is present.

Alternative diagnostic methods for the detection of gene specific nucleic acid molecules, in patient samples or other appropriate cell sources, may involve their amplification, *e.g.*, by PCR (the experimental embodiment set forth in Mullis, K.B., 1987, U.S. Patent No. 4,683,202), followed by the detection of the amplified molecules using techniques well known to those of skill in the art. The resulting amplified sequences can be compared to those which would be expected if the nucleic acid being amplified contained only normal copies of the respective gene in order to determine whether a gene mutation exists.

Additionally, well-known genotyping techniques can be performed to identify individuals carrying mutations in any of the genes of the current invention. Such techniques include, for example, the use of restriction fragment length polymorphisms (RFLPs), which involve sequence variations in one of the recognition sites for the specific restriction enzyme used.

Furthermore, the polynucleotide sequences of the current invention may be mapped to chromosomes and specific regions of chromosomes using well known genetic and/or chromosomal mapping techniques. These techniques include *in situ* hybridization, linkage analysis against known chromosomal markers, hybridization screening with libraries or flow-sorted chromosomal preparations specific to known chromosomes, and the like. The technique of fluorescent *in situ* hybridization of chromosome spreads has been described, for example, in Verma *et al.* (1988) Human Chromosomes: A Manual of Basic Techniques, Pergamon Press, New York. Fluorescent *in situ* hybridization of chromosomal preparations and other physical chromosome mapping techniques may be correlated with additional genetic map data. Examples of genetic map data can be found, for example, in Genetic Maps: Locus Maps of Complex Genomes, Book 5: Human Maps, O'Brien, editor, Cold

Spring Harbor Laboratory Press (1990). Comparisons of physical chromosomal map data may be of particular interest in detecting genetic diseases in carrier states.

The level of expression of genes can also be assayed by detecting and measuring the transcription of such genes. For example, RNA from a cell type or tissue known, or suspected to express any of the genes of the current invention can be isolated and tested utilizing hybridization or PCR techniques (e.g., northern or RT PCR) such as those described, above. Such analyses may reveal both quantitative and qualitative aspects of the expression pattern of the respective gene, including activation or inactivation of gene expression. *In situ* hybridization using suitable radioactive labels, enzymatic labels, or chemically tagged forms of the described polynucleotide sequences can also be used to assess expression patterns *in vivo*.

Additionally, an oligonucleotide or polynucleotide sequence first disclosed in at least a portion of one of the GTS sequences of SEQ ID NOS:9-1008 can be used as a hybridization probe in conjunction with a solid support matrix/substrate (resins, beads, membranes, plastics, polymers, metal or metallized substrates, crystalline or polycrystalline substrates, etc.). Of particular note are spatially addressable arrays (*i.e.*, gene chips, microtiter plates, etc.) of oligonucleotides and polynucleotides, or corresponding oligopeptides and polypeptides, wherein at least one of the biopolymers present on the spatially addressable array comprises an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008, or an amino acid sequence encoded thereby. Methods for attaching biopolymers to, or synthesizing biopolymers on, solid support matrices, and conducting binding studies thereon are disclosed in, *inter alia*, U.S. Patent Nos. 5,556,752, 5,744,305, 4,631,211, 5,445,934, 5,252,743, 4,713,326, 5,424,186, and 4,689,405 the disclosures of which are herein incorporated by reference in their entirety.

Oligonucleotides corresponding to the described GTSs can be used as hybridization probes either singly or in chip format. For example, a series of such GTS oligonucleotide sequences, or the complements thereof, can be used to represent all or a portion of the described GTS sequences. The oligonucleotides, typically between about 16 to about 40 (or any whole number within the stated range) nucleotides in length, may partially overlap each other and/or the NHP sequence may be represented using oligonucleotides that do not

overlap. Accordingly, the described NHP polynucleotide sequences shall typically comprise at least about two or three distinct oligonucleotide sequences of at least about 18, and preferably about 25, nucleotides in length that are first disclosed in the described Sequence Listing. Such oligonucleotide sequences may begin at any nucleotide present within a sequence in the Sequence Listing and proceed in either a sense (5'-to-3') orientation vis-a-vis the described sequence or in an antisense orientation.

Although the presently described GTSs have been specifically described using nucleotide sequence, it should be appreciated that each of the GTSs can uniquely be described using any of a wide variety of additional structural attributes, or combinations thereof. For example, a given GTS can be described by the net composition of the nucleotides present within a given region of the GTS in conjunction with the presence of one or more specific oligonucleotide sequence(s) first disclosed in the GTS. Alternatively, a restriction map specifying the relative positions of restriction endonuclease digestion sites, or various palindromic or other specific oligonucleotide sequences can be used to structurally describe a given GTS. Such restriction maps, which are typically generated by widely available computer programs (*e.g.*, the University of Wisconsin GCG sequence analysis package, SEQUENCHER 3.0, Gene Codes Corp., Ann Arbor, MI, etc.), can optionally be used in conjunction with one or more discrete nucleotide sequence(s) present in the GTS that can be described by the relative position of the sequence relative to one or more additional sequence(s) or one or more restriction sites present in the GTS.

5.5.2 DETECTION OF THE GENE PRODUCTS OF THE CURRENT INVENTION

Antibodies directed against wild type or mutant gene products of the current invention or conserved variants or peptide fragments thereof, which are discussed above in Section 5.4 may also be used as diagnostics and prognostics for disorders affecting development and cellular differentiation, as described herein. Such diagnostic methods, may be used to detect abnormalities in the level of gene expression, or abnormalities in the structure and/or temporal, tissue, cellular, or subcellular location of the respective gene product, and may be performed *in vivo* or *in vitro*, such as, for example, on biopsy tissue.

The tissue or cell type to be analyzed will generally include those which are known, or suspected, to contain cells that express the respective gene. The protein isolation methods employed herein may, for example, be such as those described in Harlow and Lane (Harlow, E. and Lane, D., 1988, "Antibodies: A Laboratory Manual", Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York), which is incorporated herein by reference in its entirety. The isolated cells can be derived from cell culture or from a patient. The analysis of cells taken from culture may be a necessary step in the assessment of cells that could be used as part of a cell-based gene therapy technique or, alternatively, to test the effect of compounds on the expression of the respective gene.

For example, antibodies, or fragments of antibodies, such as those described above in Section 5.4 are also useful in the present invention to quantitatively or qualitatively detect the presence of gene products of the current invention or conserved variants or peptide fragments thereof. This can be accomplished, for example, by immunofluorescence techniques employing a fluorescently labeled antibody (see below, this Section) coupled with light microscopic, flow cytometric, or fluorimetric detection.

The antibodies (or fragments thereof) or fusion or conjugated proteins useful in the present invention may, additionally, be employed histologically, as in immunofluorescence, immunoelectron microscopy or non-immuno assays, for *in situ* detection of gene products of the current invention or conserved variants or peptide fragments thereof, or for catalytic subunit binding (in the case of labeled catalytic subunit fusion protein).

In situ detection may be accomplished by removing a histological specimen from a patient, and applying thereto a labeled antibody or fusion protein of the present invention. The antibody (or fragment) or fusion protein is preferably applied by overlaying the labeled antibody (or fragment) onto a biological sample. Through the use of such a procedure, it is possible to determine not only the presence of the gene product of the current invention, or conserved variants or peptide fragments, but also its distribution in the examined tissue. Using the present invention, those of ordinary skill will readily perceive that any of a wide variety of histological methods (such as staining procedures) can be modified in order to achieve such *in situ* detection.

Immunoassays and non-immunoassays for gene products of the current invention or conserved variants or peptide fragments thereof will typically comprise incubating a sample, such as a biological fluid, a tissue extract, freshly harvested cells, or lysates of cells which have been incubated in cell culture, in the presence of a detectably labeled antibody capable of identifying the respective gene products of interest or conserved variants or peptide fragments thereof, and detecting the bound antibody by any of a number of techniques well-known in the art.

The biological sample may be brought in contact with and immobilized onto a solid phase support or carrier such as nitrocellulose, or other solid support which is capable of immobilizing cells, cell particles or soluble proteins. The support may then be washed with suitable buffers followed by treatment with the detectably labeled antibody specific to the peptide or protein of interest of the current invention or with fusion protein. The solid phase support may then be washed with the buffer a second time to remove unbound antibody or fusion protein. The amount of bound label on solid support may then be detected by conventional means.

"Solid phase support or carrier" is intended to encompass any support capable of binding an antigen or an antibody. Well-known supports or carriers include glass, polystyrene, polypropylene, polyethylene, dextran, nylon, amylases, natural and modified celluloses, polyacrylamides, gabbros, and magnetite. The nature of the carrier can be either soluble to some extent or insoluble for the purposes of the present invention. The support material may have virtually any possible structural configuration so long as the coupled molecule is capable of binding to an antigen or antibody. Thus, the support configuration may be spherical, as in a bead, or cylindrical, as in the inside surface of a test tube, or the external surface of a rod. Alternatively, the surface may be flat such as a sheet, test strip, etc. Preferred supports include polystyrene beads. Those skilled in the art will know many other suitable carriers for binding antibody or antigen, or will be able to ascertain the same by use of routine experimentation.

The binding activity of a given lot of antibody or fusion protein may be determined according to well known methods. Those skilled in the art will be able to determine operative and optimal assay conditions for each determination by employing routine experimentation.

With respect to antibodies, one of the ways in which the antibody can be detectably labeled is by linking the same to an enzyme and use in an enzyme immunoassay (EIA) (Voller, "The Enzyme Linked Immunosorbent Assay (ELISA)", 1978, Diagnostic Horizons *2*:1-7, Microbiological Associates Quarterly Publication, Walkersville, MD); Voller *et al.*, 1978, J. Clin. Pathol. *31*:507-520; Butler, 1981, Meth. Enzymol. *73*:482-523; Maggio (ed.), 1980, Enzyme Immunoassay, CRC Press, Boca Raton, FL,; Ishikawa *et al.*, (eds.), 1981, Enzyme Immunoassay, Kgaku Shoin, Tokyo). The enzyme which is bound to the antibody will react with an appropriate substrate, preferably a chromogenic substrate, in such a manner as to produce a chemical moiety which can be detected, for example, by spectrophotometric, fluorimetric or by visual means. Enzymes which can be used to detectably label the antibody include, but are not limited to, malate dehydrogenase, staphylococcal nuclease, delta-5-steroid isomerase, yeast alcohol dehydrogenase, alpha-glycerophosphate, dehydrogenase, triose phosphate isomerase, horseradish peroxidase, alkaline phosphatase, asparaginase, glucose oxidase, beta-galactosidase, ribonuclease, urease, catalase, glucose-6-phosphate dehydrogenase, glucoamylase and acetylcholinesterase. The detection can be accomplished by colorimetric methods which employ a chromogenic substrate for the enzyme. Detection may also be accomplished by visual comparison of the extent of enzymatic reaction of a substrate in comparison with similarly prepared standards.

Detection may also be accomplished using any of a variety of other immunoassays. For example, by radioactively labeling the antibodies or antibody fragments, it is possible to detect the peptide or protein of interest through the use of a radioimmunoassay (RIA) (see, for example, Weintraub, B., Principles of Radioimmunoassays, Seventh Training Course on Radioligand Assay Techniques, The Endocrine Society, March, 1986, which is incorporated by reference herein). The radioactive isotope can be detected by such means as the use of a gamma counter or a scintillation counter or by autoradiography.

It is also possible to label the antibody with a fluorescent compound. When the fluorescently labeled antibody is exposed to light of the proper wave length, its presence can then be detected due to fluorescence. Among the most commonly used fluorescent labeling compounds are fluorescein isothiocyanate, rhodamine, phycoerythrin, phycocyanin, allophycocyanin and fluorescamine.

The antibody can also be detectably labeled using fluorescence emitting metals such as ^{152}Eu, or others of the lanthanide series. These metals can be attached to the antibody using such metal chelating groups as diethylenetriaminepentacetic acid (DTPA) or ethylenediaminetetraacetic acid (EDTA).

The antibody also can be detectably labeled by coupling it to a chemiluminescent compound. The presence of the chemiluminescent-tagged antibody is then determined by detecting the presence of luminescence that arises during the course of a chemical reaction. Examples of particularly useful chemiluminescent labeling compounds are luminol, isoluminol, theromatic acridinium ester, imidazole, acridinium salt and oxalate ester.

Likewise, a bioluminescent compound may be used to label the antibody of the present invention. Bioluminescence is a type of chemiluminescence found in biological systems in, which a catalytic protein increases the efficiency of the chemiluminescent reaction. The presence of a bioluminescent protein is determined by detecting the presence of luminescence. Important bioluminescent compounds for labeling purposes include, but are not limited to, luciferin, luciferase and aequorin.

An additional use of a peptide or polypeptide encoded by an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008 is by incorporating the sequence into a phage display, or other peptide library/binding, system that can be used to screen for proteins, or other ligands, that are capable of binding to an amino acid sequence encoded by an oligonucleotide or polynucleotide sequence first disclosed in at least one of the GTS sequences of SEQ ID NOS:9-1008 (see U.S. Patents Nos. 5,270,170, and 5,432,018, herein incorporated by reference in their entirety). Moreover, peptide arrays comprising a novel amino acid sequence corresponding to a portion of at least one of the polynucleotide sequences first disclosed in SEQ ID NOS:9-1008 can be generated and screened essentially as described in U.S. Patents Nos. 5,143,854, 5,405,783, and 5,252,743, the complete disclosures of which are herein incorporated by references.

Additionally, the presently described GTSs, or primers derived therefrom, can be used to screen spatially addressable arrays, or pools therefrom, of clones present in a full-length human cDNA library. The 96 well microtiter plate format is especially well-suited to the

screening, by PCR for example, of pooled subfractions of cDNA clones.

5.6 SCREENING ASSAYS FOR COMPOUNDS THAT MODULATE THE EXPRESSION OR ACTIVITY OF PEPTIDES AND PROTEINS OF THE CURRENT INVENTION

The following assays are designed to identify compounds that interact with (*e.g.*, bind to) peptides and proteins at least partially encoded by one of SEQ ID NOS:9-1008 (i.e. peptides or proteins of the current invention) compounds that interact with (*e.g.*, bind to) intracellular proteins that interact with peptides and proteins of the current invention, compounds that interfere with the interaction of peptides and proteins of the current invention with each other and with other intracellular proteins involved in developmental and cell differentiation processes, and to compounds which modulate the activity of genes of the current invention (*i.e.*, modulate the level of expression of genes of the current invention) or modulate the level of gene products of the current invention. Assays may additionally be utilized which identify compounds which bind to gene regulatory sequences (*e.g.*, promoter sequences) and which may modulate the expression of genes of the current invention. See *e.g.*, Platt, K.A., 1994, J. Biol. Chem. 269:28558-28562, which is incorporated herein by reference in its entirety.

Compounds that can be screened in accordance with the invention include, but are not limited to, peptides, antibodies and fragments thereof, prostaglandins, lipids and other organic compounds (*e.g.*, terpines, peptidomimetics) that bind to the peptide or protein of interest of the current invention and either mimic the activity triggered by the natural ligand (*i.e.*, agonists) or inhibit the activity triggered by the natural ligand (*i.e.*, antagonists); as well as peptides, antibodies or fragments thereof, and other organic compounds that mimic the peptide or protein of interest of the current invention (or a portion thereof) and bind to and "neutralize" natural ligand.

Such compounds may include, but are not limited to, peptides such as, for example, soluble peptides, including but not limited to members of random peptide libraries (see, *e.g.*, Lam, K.S. *et al.*, 1991, Nature 354:82-84; Houghten, R. *et al.*, 1991, Nature 354:84-86), and combinatorial chemistry-derived molecular library peptides made of D- and/or L-configuration amino acids, phosphopeptides (including, but not limited to, members of

random or partially degenerate, directed phosphopeptide libraries; see, *e.g.*, Songyang, Z. *et al.*, 1993, Cell 72:767-778); antibodies (including, but not limited to, polyclonal, monoclonal, humanized, anti-idiotypic, chimeric or single chain antibodies, and Fab, $F(ab')_2$ and Fab expression library fragments, and epitope-binding fragments thereof); and small organic or inorganic molecules.

Other compounds that can be screened in accordance with the invention include, but are not limited to, small organic molecules that are able to gain entry into an appropriate cell (*e.g.*, in ES cells) and affect the expression of a gene of the current invention or some other gene involved in development and cell differentiation (*e.g.*, by interacting with the regulatory region or transcription factors involved in gene expression); or such compounds that affect the activity of the peptide or protein of interest of the current invention, *e.g.*, by inhibiting or enhancing the binding of such peptide or protein to another cellular peptide or protein, or other factor, necessary for catalysis, signal transduction, or the like, that is involved in developmental or cell differentiation processes.

Computer modeling and searching technologies permit the identification of compounds, or the improvement of already identified compounds, that can modulate the expression or activity of peptides or proteins of interest of the current invention. Having identified such a compound or composition, the active sites or regions are identified. Such active sites might typically be the binding partner sites, such as, for example, the interaction domains of the peptides and proteins of the current invention with their respective binding partners. The active site can be identified using methods known in the art including, for example, from study of the amino acid sequences of peptides, from the nucleotide sequences of nucleic acids, or from study of complexes of the relevant compound or composition with its natural ligand. In the latter case, chemical or X-ray crystallographic methods can be used to find the active site by finding where on the factor the complexed ligand is found.

Next, the three dimensional geometric structure of the active site is determined. This can be done by known methods, including X-ray crystallography, which can determine a complete molecular structure. On the other hand, solid or liquid phase NMR can be used to determine certain intra-molecular distances. Any other experimental method of structure determination can be used to obtain partial or complete geometric structures. The geometric

structures may be measured with a complexed ligand, natural or artificial, which may increase the accuracy of the active site structure determined.

If an incomplete or insufficiently accurate structure is determined, the methods of computer based numerical modeling can be used to complete the structure or improve its accuracy. Any recognized modeling method may be used, including parameterized models specific to particular biopolymers such as proteins or nucleic acids, molecular dynamics models based on computing molecular motions, statistical mechanics models based on thermal ensembles, or combined models. For most types of models, standard molecular force fields, representing the forces between constituent atoms and groups, are necessary, and can be selected from force fields known in physical chemistry. The incomplete or less accurate experimental structures can serve as constraints on the complete and more accurate structures computed by these modeling methods.

Finally, having determined the structure of the active site, either experimentally, by modeling, or by a combination, candidate modulating compounds can be identified by searching databases containing compounds along with information on their molecular structure. Such a search seeks compounds having structures that match the determined active site structure and that interact with the groups defining the active site. Such a search can be manual, but is preferably computer assisted. These compounds found from this search are potential modulating compounds of the peptides and proteins of interest of the current invention.

Alternatively, these methods can be used to identify improved modulating compounds from an already known modulating compound or ligand. The composition of the known compound can be modified and the structural effects of modification can be determined using the experimental and computer modeling methods described above applied to the new composition. The altered structure is then compared to the active site structure of the compound to determine if an improved fit or interaction results. In this manner, systematic variations in composition, such as by varying side groups, can be quickly evaluated to obtain modified modulating compounds or ligands of improved specificity or activity.

Further experimental and computer modeling methods useful to identify modulating compounds based upon identification of the active sites of peptides and proteins of interest of

the current invention, and related factors involved in development, cellular differentiation, and other cellular processes will be apparent to those of skill in the art.

Examples of molecular modeling systems are the CHARM and QUANTA programs (Polygon Corporation, Waltham, MA). CHARM performs the energy minimization and molecular dynamics functions. QUANTA performs the construction, graphic modeling and analysis of molecular structure. QUANTA allows interactive construction, modification, visualization, and analysis of the behavior of molecules with each other.

A number of articles review computer modeling of drugs interactive with specific proteins, such as Rotivinen *et al.*, 1988, Acta Pharmaceutical Fennica *97*:159-166; Ripka, New Scientist 54-57 (June 16, 1988); McKinaly and Rossmann, 1989, Annu. Rev. Pharmacol. Toxicol. *29*:111-122; Perry and Davies, OSAR: Quantitative Structure-Activity Relationships in Drug Design pp. 189-193 (Alan R. Liss, Inc. 1989); Lewis and Dean, 1989, Proc. R. Soc. Lond. *236*:125-140 and 141-162; and, with respect to a model receptor for nucleic acid components, Askew *et al.*, 1989, J. Am. Chem. Soc. *111*:1082-1090. Other computer programs that screen and graphically depict chemicals are available from companies such as BioDesign, Inc. (Pasadena, CA.), Allelix, Inc. (Mississauga, Ontario, Canada), and Hypercube, Inc. (Cambridge, Ontario). Although these are primarily designed for application to drugs specific to particular proteins, they can be adapted to the design of drugs specific to regions of DNA or RNA, once that region is identified.

Although described above with reference to design and generation of compounds which could alter binding, one could also screen libraries of known compounds, including natural products or synthetic chemicals, and biologically active materials, including proteins, for compounds which are inhibitors or activators.

Compounds identified via assays such as those described herein may be useful, for example, in elaborating the biological function of the gene products of interest of the current invention and for ameliorating disorders affecting development and cell differentiation. Assays for testing the effectiveness of compounds, identified by, for example, techniques such as those described below.

5.6.1. *IN VITRO* SCREENING ASSAYS FOR COMPOUNDS THAT BIND TO PEPTIDES AND PROTEINS OF THE CURRENT INVENTION

In vitro systems may be designed to identify compounds capable of interacting with (*e.g.*, binding to) peptides and proteins of interest of the current invention, fragments thereof, and variants thereof. The identified compounds can be useful, for example, in modulating the activity of wild type and/or mutant gene products of the current invention; may be utilized in screens for identifying compounds that disrupt normal interactions of the peptides and proteins of the current invention with other factors, like, for example, other peptides and proteins; or may in themselves disrupt such interactions.

The principle of the assays used to identify compounds that bind to the peptides and proteins of the current invention involves preparing a reaction mixture of the peptides and proteins of interest that are disclosed by the current invention and a test compound under conditions and for a time sufficient to allow the two components to interact and bind, thus forming a complex that can be removed from and/or detected in the reaction mixture. The peptides and proteins of the current invention used can vary depending upon the goal of the screening assay. For example, where agonists of the natural ligand are sought, the full length peptide or protein of interest, or a fusion protein containing the subunit of interest fused to a protein or polypeptide that affords advantages in the assay system (*e.g.*, labeling, isolation of the resulting complex, etc.) can be utilized.

The screening assays can be conducted in a variety of ways. For example, one method of conducting such an assay involves anchoring the peptide or protein of interest, or a fragment or fusion protein thereof, or the test substance onto a solid phase and detecting peptide or protein of interest/test compound complexes anchored on the solid phase at the end of the reaction. In one embodiment of such a method, the peptide or protein of interest may be anchored onto a solid surface, and the test compound, which is not anchored, may be labeled, either directly or indirectly. In another embodiment of the method, a peptide or protein of interest of the current invention anchored on the solid phase is complexed with a natural ligand of such peptide or protein of interest. Then, a test compound could be assayed for its ability to disrupt the association of the complex.

In practice, microtiter plates may conveniently be utilized as the solid phase. The anchored component may be immobilized by non-covalent or covalent attachments. Non-covalent attachment may be accomplished by simply coating the solid surface with a solution of the protein and drying. Alternatively, an immobilized antibody, preferably a monoclonal antibody, specific for the peptide or protein to be immobilized may be used to anchor the peptide or protein to the solid surface. The surfaces may be prepared in advance and stored.

In order to conduct the assay, the nonimmobilized component is added to the coated surface containing the anchored component. After the reaction is complete, unreacted components are removed (*e.g.*, by washing) under conditions such that any complexes formed will remain immobilized on the solid surface. The detection of complexes anchored on the solid surface can be accomplished in a number of ways. Where the previously nonimmobilized component is pre-labeled, the detection of label immobilized on the surface indicates that complexes were formed. Where the previously nonimmobilized component is not pre-labeled, an indirect label can be used to detect complexes anchored on the surface; *e.g.*, using a labeled antibody specific for the previously nonimmobilized component (the antibody, in turn, may be directly labeled or indirectly labeled with a labeled anti-Ig antibody).

Alternatively, a reaction can be conducted in a liquid phase, the reaction products separated from unreacted components, and complexes detected; *e.g.*, using an immobilized antibody specific for one component of complexes formed, like, for example, the peptide or protein of interest of the current invention or the test compound to anchor any complexes formed in solution, and a labeled antibody specific for the other component of the possible complex to detect anchored complexes.

5.6.2 ASSAYS FOR INTRACELLULAR PROTEINS THAT INTERACT WITH THE PEPTIDES AND PROTEINS OF THE CURRENT INVENTION

Any method suitable for detecting protein-protein interactions may be employed for identifying intracellular peptides and proteins that interact with peptides and proteins of the current invention. Among the traditional methods which may be employed are co-immunoprecipitation, crosslinking and co-purification through gradients or

chromatographic columns of cell lysates or proteins obtained from cell lysates and the peptides and proteins of the current invention to identify proteins in the lysate that interact with those peptides and proteins of the current invention. For these assays, the peptides and proteins of the current invention may be used in full length, or in truncated or modified forms or as fusion-proteins. Similarly, the component may be a complex of two or more of the peptides and proteins of the current invention. Once isolated, such an intracellular protein can be identified and can, in turn, be used in conjunction with standard techniques to identify proteins with which it interacts. For example, at least a portion of the amino acid sequence of an intracellular protein which interacts with a peptide or protein of the current invention, can be ascertained using techniques well known to those of skill in the art, such as via the Edman degradation technique. (See, *e.g.*, Creighton, 1983, "Proteins: Structures and Molecular Principles", W.H. Freeman & Co., N.Y., pp.34-49). The amino acid sequence obtained may be used as a guide for the generation of oligonucleotide mixtures that can be used to screen for gene sequences encoding such intracellular proteins. Screening may be accomplished, for example, by standard hybridization or PCR techniques. Techniques for the generation of oligonucleotide mixtures and the screening are well-known. (See, *e.g.*, Ausubel, supra., and PCR Protocols: A Guide to Methods and Applications, 1990, Innis, M. *et al.*, eds. Academic Press, Inc., New York).

Additionally, methods may be employed which result in the simultaneous identification of genes which encode the intracellular proteins interacting with peptides and proteins of the current invention. These methods include, for example, probing expression libraries, in a manner similar to the well known technique of antibody probing of ëgt11 libraries, using a labeled form of a peptide or protein of the current invention, or a fusion protein, *e.g.*, a peptide or protein at least partially encoded by a GTS of the present invention fused to a marker (*e.g.*, an enzyme, fluor, luminescent protein, or dye), or an Ig-Fc domain.

One method that detects protein interactions *in vivo*, the two-hybrid system, is described in detail for illustration only and not by way of limitation. One version of this system has been described (Chien *et al.*, 1991, Proc. Natl. Acad. Sci. USA, 88:9578-9582) and is commercially available from Clontech (Palo Alto, CA).

Briefly, utilizing such a system, plasmids are constructed that encode two hybrid proteins: one plasmid consists of nucleotides encoding the DNA-binding domain of a transcription activator protein fused to a nucleotide sequence of the current invention encoding a peptide or protein of the current invention, a modified or truncated form or a fusion protein, and the other plasmid consists of nucleotides encoding the transcription activator protein's activation domain fused to a cDNA encoding an unknown protein which has been recombined into this plasmid as part of a cDNA library. The DNA-binding domain fusion plasmid and the cDNA library are transformed into a strain of the yeast *Saccharomyces cerevisiae* that contains a reporter gene (*e.g.*, HBS or *lacZ*) whose regulatory region contains the transcription activator's binding site. Either hybrid protein alone cannot activate transcription of the reporter gene; the DNA-binding domain hybrid cannot because it does not provide activation function, and the activation domain hybrid cannot because it cannot localize to the activator's binding sites. Interaction of the two hybrid proteins reconstitutes the functional activator protein and results in expression of the reporter gene, which is detected by an assay for the reporter gene product.

The two-hybrid system or related methodology may be used to screen activation domain libraries for proteins that interact with the "bait" gene product. By way of example, and not by way of limitation, a peptide or protein of the current invention may be used as the bait gene product. Total genomic or cDNA sequences are fused to the DNA encoding an activation domain. This library and a plasmid encoding a hybrid of a bait gene product of the current invention fused to the DNA-binding domain are cotransformed into a yeast reporter strain, and the resulting transformants are screened for those that express the reporter gene. For example, and not by way of limitation, a bait gene sequence of the current invention can be cloned into a vector such that it is translationally fused to the DNA encoding the DNA-binding domain of the GAL4 protein. These colonies are purified and the library plasmids responsible for reporter gene expression are isolated. DNA sequencing is then used to identify the proteins encoded by the library plasmids.

A cDNA library of the cell line from which proteins that interact with bait gene product of the current invention are to be detected can be made using methods routinely practiced in the art. According to the particular system described herein, for example, the

cDNA fragments can be inserted into a vector such that they are translationally fused to the transcriptional activation domain of GAL4. This library can be co-transfected along with the bait gene-GAL4 fusion plasmid into a yeast strain which contains a lacZ gene driven by a promoter which contains GAL4 activation sequence. A cDNA encoded protein, fused to GAL4 transcriptional activation domain, that interacts with bait gene product will reconstitute an active GAL4 protein and thereby drive expression of the HIS3 gene. Colonies which express HIS3 can be detected by their growth on petri dishes containing semi-solid agar based media lacking histidine. The cDNA can then be purified from these strains, and used to produce and isolate the bait gene-interacting protein using techniques routinely practiced in the art.

5.6.3 ASSAYS FOR COMPOUNDS THAT INTERFERE WITH INTERACTIONS OF THE PEPTIDES AND PROTEINS OF THE CURRENT INVENTION WITH INTRACELLULAR MACROMOLECULES

The macromolecules that interact with the peptides and proteins of the current invention are referred to, for purposes of this discussion, as "binding partners". These binding partners are likely to be involved in catalytic reactions or signal transduction pathways, and therefore, in the role of the peptides and proteins of the current invention in development and cell differentiation. It is also desirable to identify compounds that interfere with or disrupt the interaction of such binding partners with the peptides and proteins of the current invention which may be useful in regulating the activity of the peptides and proteins of the current invention and thus control development and cell differentiation disorders associated with the activity of the peptides and proteins of the current invention.

The basic principle of the assay systems used to identify compounds that interfere with the interaction between the peptides and proteins of the current invention and its binding partner or partners involves preparing a reaction mixture containing the peptides or proteins of the current invention of interest, modified or truncated version thereof, or fusion proteins thereof as described above, and the binding partner under conditions and for a time sufficient to allow the two to interact and bind, thus forming a complex. In order to test a compound for inhibitory activity, the reaction mixture is prepared in the presence and absence of the test

compound. The test compound may be initially included in the reaction mixture, or may be added at a time subsequent to the addition of the peptide or protein of the current invention and its binding partner. Control reaction mixtures are incubated without the test compound or with a placebo. The formation of any complexes between the peptide or protein of the current invention and the binding partner is then detected. The formation of a complex in the control reaction, but not in the reaction mixture containing the test compound, indicates that the compound interferes with the interaction of the peptide or protein at least partially encoded by a GTS of the present invention and the interactive binding partner. Additionally, complex formation within reaction mixtures containing the test compound and normal peptide or protein of the current invention may also be compared to complex formation within reaction mixtures containing the test compound and a mutant peptide or protein of the current invention. This comparison can be important in those cases wherein it is desirable to identify compounds that disrupt interactions of mutant but not normal forms of a peptide or protein of the current invention.

The assay for compounds that interfere with the interaction of a peptide or protein of the current invention and binding partners can be conducted in a heterogeneous or homogeneous format. Heterogeneous assays involve anchoring either the peptide or protein of the current invention or the binding partner onto a solid phase and detecting complexes anchored on the solid phase at the end of the reaction. In homogeneous assays, the entire reaction is carried out in a liquid phase. In either approach, the order of addition of reactants can be varied to obtain different information about the compounds being tested. For example, test compounds that interfere with the interaction by competition can be identified by conducting the reaction in the presence of the test substance; *i.e.*, by adding the test substance to the reaction mixture prior to or simultaneously with the peptide or protein of the current invention and interactive binding partner. Alternatively, test compounds that disrupt preformed complexes, *e.g.* compounds with higher binding constants that displace one of the components from the complex, can be tested by adding the test compound to the reaction mixture after complexes have been formed. The various formats are described briefly below.

In a heterogeneous assay system, either the peptide or protein of the current invention or the interactive binding partner, is anchored onto a solid surface, while the non-anchored

species is labeled either directly or indirectly. In practice, microtiter plates are conveniently utilized. The anchored species may be immobilized by non-covalent or covalent attachments. Non-covalent attachment may be accomplished simply by coating the solid surface with a solution of the peptide or protein of the current invention or binding partner and drying. Alternatively, an immobilized antibody specific for the species to be anchored may be used to anchor the species to the solid surface. The surfaces may be prepared in advance and stored.

In order to conduct the assay, the partner of the immobilized species is exposed to the coated surface with or without the test compound. After the reaction is complete, unreacted components are removed (*e.g.*, by washing) and any complexes formed will remain immobilized on the solid surface. The detection of complexes anchored on the solid surface can be accomplished in a number of ways. Where the non-immobilized species is pre-labeled, the detection of label immobilized on the surface indicates that complexes were formed. Where the non-immobilized species is not pre-labeled, an indirect label can be used to detect complexes anchored on the surface; *e.g.*, using a labeled antibody specific for the initially non-immobilized species (the antibody, in turn, may be directly labeled or indirectly labeled with a labeled anti-Ig antibody). Depending upon the order of addition of reaction components, test compounds which inhibit complex formation or which disrupt preformed complexes can be detected.

Alternatively, the reaction can be conducted in a liquid phase in the presence or absence of the test compound, the reaction products separated from unreacted components, and complexes detected; *e.g.*, using an immobilized antibody specific for one of the binding components to anchor any complexes formed in solution, and a labeled antibody specific for the other partner to detect anchored complexes. Again, depending upon the order of addition of reactants to the liquid phase, test compounds which inhibit complex or which disrupt preformed complexes can be identified.

In an alternate embodiment of the invention, a homogeneous assay can be used. In this approach, a preformed complex of the peptide or protein of the current invention and the interactive binding partner is prepared in which either the peptide or protein of the current invention or its binding partner is labeled, but the signal generated by the label is quenched due to formation of the complex (see, *e.g.*, U.S. Patent No. 4,109,496 by Rubenstein which

utilizes this approach for immunoassays). The addition of a test substance that competes with and displaces one of the species from the preformed complex will result in the generation of a signal above background. In this way, test substances which disrupt peptide or protein of the current invention/intracellular binding partner interaction can be identified.

In a particular embodiment, a peptide or protein of the current invention can be prepared for immobilization. For example, the peptide or protein of the current invention or a fragment thereof can be fused to a glutathione-S-transferase (GST) gene using a fusion vector, such as pGEX-5X-1, in such a manner that its binding activity is maintained in the resulting fusion protein. The interactive binding partner can be purified and used to raise a monoclonal antibody, using methods routinely practiced in the art and described above. This antibody can be labeled with the radioactive isotope ^{125}I, for example, by methods routinely practiced in the art. In a heterogeneous assay, *e.g.*, the GST-peptide or protein of the current invention fusion protein can be anchored to glutathione-agarose beads. The interactive binding partner can then be added in the presence or absence of the test compound in a manner that allows interaction and binding to occur. At the end of the reaction period, unbound material can be washed away, and the labeled monoclonal antibody can be added to the system and allowed to bind to the complexed components. The interaction between the peptide or protein of the current invention and the interactive binding partner can be detected by measuring the amount of radioactivity that remains associated with the glutathione-agarose beads. A successful inhibition of the interaction by the test compound will result in a decrease in measured radioactivity.

Alternatively, the GST-peptide or protein of the current invention fusion protein and the interactive binding partner can be mixed together in liquid in the absence of the solid glutathione-agarose beads. The test compound can be added either during or after the species are allowed to interact. This mixture can then be added to the glutathione-agarose beads and unbound material is washed away. Again the extent of inhibition of the peptide or protein of the current invention/binding partner interaction can be detected by adding the labeled antibody and measuring the radioactivity associated with the beads.

In another embodiment of the invention, these same techniques can be employed using peptide fragments that correspond to the binding domains of a peptide or protein of the

current invention and/or the interactive or binding partner (in cases where the binding partner is a protein) in place of one or both of the full length proteins. Any number of methods routinely practiced in the art can be used to identify and isolate the binding sites. These methods include, but are not limited to, mutagenesis of the gene encoding one of the proteins and screening for disruption of binding in a co-immunoprecipitation assay. Compensating mutations in the gene encoding the second species in the complex can then be selected. Sequence analysis of the genes encoding the respective proteins will reveal the mutations that correspond to the region of the protein involved in interactive binding. Alternatively, one protein can be anchored to a solid surface using methods described above, and allowed to interact with and bind to its labeled binding partner, which has been treated with a proteolytic enzyme, such as trypsin. After washing, a short, labeled peptide comprising the binding domain may remain associated with the solid material, which can be isolated and identified by amino acid sequencing. Also, once the gene coding for the intracellular binding partner is obtained, short gene segments can be engineered to express peptide fragments of the protein, which can then be tested for binding activity and purified or synthesized.

For example, and not by way of limitation, a peptide or protein of the current invention can be anchored to a solid material as described, above, by making a GST-peptide or protein of the current invention fusion protein and allowing it to bind to glutathione agarose beads. The interactive binding partner can be labeled with a radioactive isotope, such as ^{35}S, and cleaved with a proteolytic enzyme such as trypsin. Cleavage products can then be added to the anchored GST-peptide or protein of the current invention fusion protein and allowed to bind. After washing away unbound peptides, labeled bound material, representing the intracellular binding partner binding domain, can be eluted, purified, and analyzed for amino acid sequence by well-known methods. Peptides so identified can be produced synthetically or fused to appropriate facilitative proteins using recombinant DNA technology.

5.6.4 ASSAYS FOR IDENTIFICATION OF COMPOUNDS THAT AMELIORATE DISORDERS AFFECTING DEVELOPMENT AND CELL DIFFERENTIATION

Compounds including, but not limited to, binding compounds identified via assay techniques such as those described above, can be tested for the ability to ameliorate

development and cell differentiation disorder symptoms. The assays described above can identify compounds which affect the activity of peptides and proteins of the current invention (*e.g.*, compounds that bind to the peptides and proteins of the current invention, inhibit binding of their natural ligands, and compounds that bind to a natural ligand of the peptides and proteins of the current invention and neutralize the ligand activity); or compounds that affect the activity of genes encoding peptides and proteins of the current invention (by affecting the expression of those genes, including molecules, *e.g.*, proteins or small organic molecules, that affect or interfere with splicing events so that expression of the genes of interest can be modulated). However, it should be noted that the assays described herein can also identify compounds that modulate signal transduction or catalytic events that the peptides and proteins of the current invention are involved in. The identification and use of such compounds which affect a step in, for example, signal transduction pathways or catalytic events in which any of the peptides and proteins of the current invention are involved in, may modulate the effect of the peptides and proteins of the current invention on developmental or cell differentiation disorders. Such identification and use of such compounds are within the scope of the invention. Such compounds can be used as part of a therapeutic method for the treatment of developmental and cell differentiation disorders.

The invention encompasses cell-based and animal model-based assays for the identification of compounds exhibiting such an ability to ameliorate developmental and cell differentiation disorder symptoms. Such cell-based assay systems can also be used as the standard to assay for purity and potency of the natural ligand, catalytic subunit, including recombinantly or synthetically produced catalytic subunit and catalytic subunit mutants.

Cell-based systems can be used to identify compounds which may act to ameliorate developmental or cell differentiation disorder symptoms. Such cell systems can include, for example, recombinant or non-recombinant cells, such as cell lines, which express the gene encoding the peptide or protein of interest of the current invention. For example ES cells, or cell lines derived from ES cells can be used. In addition, expression host cells (*e.g.*, COS cells, CHO cells, fibroblasts, Sf9 cells) genetically engineered to express a functional peptide or protein of the current invention in addition to factors necessary for the peptide or protein of

the current invention to fulfil its physiological role of, for example, signal transduction or catalyses, can be used as an end point in the assay.

In utilizing such cell systems, cells may be exposed to a compound suspected of exhibiting an ability to ameliorate developmental or cell differentiation disorder symptoms, at a sufficient concentration and for a time sufficient to elicit such an amelioration of such disorder symptoms in the exposed cells. After exposure, the cells can be assayed to measure alterations in the expression of the gene encoding the peptide or protein of interest of the current invention, *e.g.*, by assaying cell lysates for the appropriate mRNA transcripts (*e.g.*, by Northern analysis) or for expression of the peptide or protein of interest of the current invention in the cell; compounds which regulate or modulate expression of the gene encoding the peptide or protein of interest of the current invention are valuable candidates as therapeutics. Alternatively, the cells are examined to determine whether one or more developmental or cell differentiation disorder-like cellular phenotypes has been altered to resemble a more normal or more wild type phenotype, or a phenotype more likely to produce a lower incidence or severity of disorder symptoms. Still further, the expression and/or activity of components of pathways or functionally or physiologically connected peptides or proteins of which the peptide or protein of interest of the current invention is a part, can be assayed.

For example, after exposure of the cells, cell lysates can be assayed for the presence of increased levels of the test compound as compared to lysates derived from unexposed control cells. The ability of a test compound to inhibit production of the assay compound such systems indicates that the test compound inhibits signal transduction initiated by the peptide or protein of interest of the current invention. Finally, a change in cellular morphology of intact cells may be assayed using techniques well known to those of skill in the art.

In addition, animal-based development or cell differentiation disorder systems, which may include, for example, mice, may be used to identify compounds capable of ameliorating development or cell differentiation disorder-like symptoms. Such animal models may be used as test systems for the identification of drugs, pharmaceuticals, therapies and interventions which may be effective in treating such disorders. For example, animal models may be exposed to a compound, suspected of exhibiting an ability to ameliorate development

or cell differentiation disorder symptoms, at a sufficient concentration and for a time sufficient to elicit such an amelioration of development and/or cell differentiation disorder symptoms in the exposed animals. The response of the animals to the exposure may be monitored by assessing the reversal of disorders associated with development and/or cell differentiation disorders. With regard to intervention, any treatments which reverse any aspect of development or cell differentiation disorder-like symptoms should be considered as candidates for human development and/or cell differentiation disorder therapeutic intervention. Dosages of test agents may be determined by deriving dose-response curves, as discussed below.

5.7 THE TREATMENT OF DISORDERS ASSOCIATED WITH STIMULATION OF PEPTIDES AND PROTEINS OF THE CURRENT INVENTION

The invention also encompasses methods and compositions for modifying development and cell differentiation and treating development and cell differentiation disorders. For example, one may decrease the level of expression of one or more genes of the current invention, and/or downregulate activity of one or more of the peptides or proteins of interest of the current invention. Thereby, the response of cells, like, for example, ES cells, to factors which activate the physiological responses that enhance the pathological processes leading to developmental and cell differentiation disorders may be reduced and the symptoms ameliorated. Conversely, the response of cells, like, for example, ES cells, to physiological stimuli involving any of the peptides or proteins of the current invention and necessary for proper developmental and cell differentiation processes may be augmented by increasing the activity of one or several of the peptides or proteins of interest of the current invention. Different approaches are discussed below.

5.7.1 INHIBITION OF PEPTIDES AND PROTEINS OF THE CURRENT INVENTION TO REDUCE DEVELOPMENT AND CELL DIFFERENTIATION DISORDERS

Any method which neutralizes the catalytic or signal transduction activity of the peptides and proteins of the current invention or which inhibits expression of the genes

encoding peptides and proteins (either transcription or translation) can be used to reduce symptoms associated with developmental and cell differentiation disorders.

In one embodiment, immuno therapy can be designed to reduce the level of endogenous gene expression for the peptides and proteins of the current invention, *e.g.*, using antisense or ribozyme approaches to inhibit or prevent translation of mRNA transcripts; triple helix approaches to inhibit transcription of the genes; or targeted homologous recombination to inactivate or "knock out" the genes or its endogenous promoter.

Antisense approaches involve the design of oligonucleotides (either DNA or RNA) that are complementary to mRNA specific for peptides and proteins of interest of the current invention. The antisense oligonucleotides will bind to the complementary mRNA transcripts and prevent translation. Absolute complementarity, although preferred, is not required. A sequence "complementary" to a portion of an RNA, as referred to herein, means a sequence having sufficient complementarity to be able to hybridize with the RNA, forming a stable duplex. In the case of double-stranded antisense nucleic acids, a single strand of the duplex DNA may thus be tested, or triplex formation may be assayed. The ability to hybridize will depend on both the degree of complementarity and the length of the antisense nucleic acid. Generally, the longer the hybridizing nucleic acid, the more base mismatches with an RNA it may contain and still form a stable duplex (or triplex, as the case may be). One skilled in the art can ascertain a tolerable degree of mismatch by use of standard procedures to determine the melting point of the hybridized complex.

Oligonucleotides that are complementary to the 5' end of the message, *e.g.*, the 5' untranslated sequence up to and including the AUG initiation codon, should work most efficiently at inhibiting translation. However, sequences complementary to the 3' untranslated sequences of mRNAs have recently shown to be effective at inhibiting translation of mRNAs as well. See generally, Wagner, R., 1994, Nature *372*:333-335. Thus, oligonucleotides complementary to either the 5'- or 3'- non- translated, non-coding regions of the mRNAs specific for the peptides and proteins of the current invention could be used in an antisense approach to inhibit translation of those endogenous mRNAs. Oligonucleotides complementary to the 5' untranslated region of the mRNA should include the complement of the AUG start codon. Antisense oligonucleotides complementary to mRNA coding regions

are less efficient inhibitors of translation but could be used in accordance with the invention. Whether designed to hybridize to the 5'-, 3'- or coding region of an mRNA, antisense nucleic acids should be at least six nucleotides in length, and are preferably oligonucleotides ranging from 6 to about 50 nucleotides in length. In specific aspects the oligonucleotide is at least 10 nucleotides, at least 17 nucleotides, at least 25 nucleotides or at least 50 nucleotides.

Regardless of the choice of target sequence, it is preferred that *in vitro* studies are first performed to quantitate the ability of the antisense oligonucleotide to inhibit gene expression. It is preferred that these studies utilize controls that distinguish between antisense gene inhibition and nonspecific biological effects of oligonucleotides. It is also preferred that these studies compare levels of the target RNA or protein with that of an internal control RNA or protein. Additionally, it is envisioned that results obtained using the antisense oligonucleotide are compared with those obtained using a control oligonucleotide. It is preferred that the control oligonucleotide is of approximately the same length as the test oligonucleotide and that the nucleotide sequence of the oligonucleotide differs from the antisense sequence no more than is necessary to prevent specific hybridization to the target sequence.

The oligonucleotides can be DNA or RNA or chimeric mixtures or derivatives or modified versions thereof, single-stranded or double-stranded. The oligonucleotide can be modified at the base moiety, sugar moiety, or phosphate backbone, for example, to improve stability of the molecule, hybridization, etc. The oligonucleotide may include other appended groups such as peptides (*e.g.*, for targeting host cell receptors *in vivo*), or agents facilitating transport across the cell membrane (see, e.g., Letsinger *et al.*, 1989, Proc. Natl. Acad. Sci. U.S.A. *86*:6553-6556; Lemaitre *et al.*, 1987, Proc. Natl. Acad. Sci. *84*:648-652; PCT Publication No. WO88/09810, published December 15, 1988), or hybridization-triggered cleavage agents. (See, e.g., Krol *et al.*, 1988, BioTechniques *6*:958-976) or intercalating agents. (See, *e.g.*, Zon, 1988, Pharm. Res. 5:539-549). To this end, the oligonucleotide may be conjugated to another molecule, *e.g.*, a peptide, hybridization triggered cross-linking agent, transport agent, hybridization-triggered cleavage agent, etc.

The antisense oligonucleotide may comprise at least one modified base moiety which is selected from the group including, but not limited to, 5-fluorouracil, 5-bromouracil,

5-chlorouracil, 5-iodouracil, hypoxanthine, xantine, 4-acetylcytosine, 5-(carboxyhydroxylmethyl) uracil, 5-carboxymethylaminomethyl-2-thiouridine, 5-carboxymethylaminomethyluracil, dihydrouracil, beta-D-galactosylqueosine, inosine, N6-isopentenyladenine, 1-methylguanine, 1-methylinosine, 2,2-dimethylguanine, 2-methyladenine, 2-methylguanine, 3-methylcytosine, 5-methylcytosine, N6-adenine, 7-methylguanine, 5-methylaminomethyluracil, 5-methoxyaminomethyl-2-thiouracil, beta-D-mannosylqueosine, 5′-methoxycarboxymethyluracil, 5-methoxyuracil, 2-methylthio-N6-isopentenyladenine, uracil-5-oxyacetic acid (v), wybutoxosine, pseudouracil, queosine, 2-thiocytosine, 5-methyl-2-thiouracil, 2-thiouracil, 4-thiouracil, 5-methyluracil, uracil-5-oxyacetic acid methylester, uracil-5-oxyacetic acid (v), 5-methyl-2-thiouracil, 3-(3-amino-3-N-2-carboxypropyl) uracil, (acp3)w, and 2,6-diaminopurine.

The antisense oligonucleotide may also comprise at least one modified sugar moiety selected from the group including, but not limited to, arabinose, 2-fluoroarabinose, xylulose, and hexose.

In another embodiment, the antisense oligonucleotide comprises at least one modified phosphate backbone selected from the group consisting of a phosphorothioate, a phosphorodithioate, a phosphoramidothioate, a phosphoramidate, a phosphordiamidate, a methylphosphonate, an alkyl phosphotriester, and a formacetal or analog thereof.

In yet another embodiment, the antisense oligonucleotide is an alpha-anomeric oligonucleotide. An alpha-anomeric oligonucleotide forms specific double-stranded hybrids with complementary RNA in which, contrary to the usual alpha-units, the strands run parallel to each other (Gautier *et al.*, 1987, Nucl. Acids Res. *15*:6625-6641). The oligonucleotide is a 2′-0-methylribonucleotide (Inoue *et al.*, 1987, Nucl. Acids Res. *15*:6131-6148), or a chimeric RNA-DNA analogue (Inoue *et al.*, 1987, FEBS Lett. *215*:327-330).

Oligonucleotides of the invention may be synthesized by standard methods known in the art, *e.g.* by use of an automated DNA synthesizer (such as are commercially available from Biosearch, Applied Biosystems, etc.). As examples, phosphorothioate oligonucleotides may be synthesized by the method of Stein *et al.*, 1988, Nucl. Acids Res. *16*:3209. Methylphosphonate oligonucleotides can be prepared by use of controlled pore glass polymer supports (Sarin *et al.*, 1988, Proc. Natl. Acad. Sci. U.S.A. *85*:7448-7451).

While antisense nucleotides complementary to the coding region sequence specific for the peptides and proteins of the current invention could be used, those complementary to the transcribed untranslated region are most preferred.

The antisense molecules should be delivered to cells which express the peptides and proteins of interest of the current invention *in vivo*, like, for example, ES cells. A number of methods have been developed for delivering antisense DNA or RNA to cells; *e.g.*, antisense molecules can be injected directly into the tissue or cell derivation site, or modified antisense molecules, designed to target the desired cells (*e.g.*, antisense linked to peptides or antibodies that specifically bind receptors or antigens expressed on the target cell surface) can be administered systemically.

However, it is often difficult to achieve intracellular concentrations of antisense molecules that are sufficient to suppress translation of endogenous mRNAs. Therefore a preferred approach utilizes a recombinant DNA construct in which the antisense oligonucleotide is placed under the control of a strong pol III or pol II promoter. The use of such a construct to transfect target cells in the patient will result in the transcription of sufficient amounts of single stranded RNAs that will form complementary base pairs with the endogenous transcripts specific for the peptides and proteins of interest of the current invention and thereby prevent translation of the respective mRNAs. For example, a vector can be introduced *in vivo* such that it is taken up by a cell and directs the transcription of an antisense RNA. Such a vector can remain episomal or become chromosomally integrated, as long as it can be transcribed to produce the desired antisense RNA. Such vectors can be constructed by recombinant DNA technology methods standard in the art. Vectors can be plasmid, viral, or others known in the art, used for replication and expression in mammalian cells. Expression of the sequence encoding the antisense RNA can be by any promoter known in the art to act in mammalian, preferably human cells. Such promoters can be inducible or constitutive. Such promoters include, but are not limited to: the SV40 early promoter region (Bernoist and Chambon, 1981, Nature 290:304-310), the promoter contained in the 3′ long terminal repeat of Rous sarcoma virus (Yamamoto *et al.*, 1980, Cell 22:787-797), the herpes thymidine kinase promoter (Wagner *et al.*, 1981, Proc. Natl. Acad. Sci. U.S.A. 78:1441-1445), the regulatory sequences of the metallothionein gene (Brinster *et al.*,

1982, Nature 296:39-42), etc. Any type of plasmid, cosmid, YAC or viral vector can be used to prepare the recombinant DNA construct which can be introduced directly into the tissue or cell derivation site; *e.g.*, the bone marrow. Alternatively, viral vectors can be used which selectively infect the desired tissue or cell type; (*e.g.*, viruses which infect cells of hematopoietic lineage), in which case administration may be accomplished by another route (*e.g.*, systemically).

Ribozyme molecules designed to catalytically cleave mRNA transcripts specific for the peptides and proteins of interest of the current invention can also be used to prevent translation of the mRNAs of interest and expression of the peptides and proteins encoded by those mRNAs. (See, *e.g.*, PCT International Publication WO90/11364, published October 4, 1990; Sarver *et al.*, 1990, Science 247:1222-1225). While ribozymes that cleave mRNA at site specific recognition sequences can be used to destroy mRNAs, the use of hammerhead ribozymes is preferred. Hammerhead ribozymes cleave mRNAs at locations dictated by flanking regions that form complementary base pairs with the target mRNA. The sole requirement is that the target mRNA have the following sequence of two bases: 5'-UG-3'. The construction and production of hammerhead ribozymes is well known in the art and is described more fully in Haseloff and Gerlach, 1988, Nature, *334*:585-591. Preferably the ribozyme is engineered so that the cleavage recognition site is located near the 5' end of the mRNA of interest; *i.e.*, to increase efficiency and minimize the intracellular accumulation of non-functional mRNA transcripts.

The ribozymes of the present invention also include RNA endoribonucleases (hereinafter "Cech-type ribozymes") such as the one which occurs naturally in Tetrahymena Thermophila (known as the IVS, or L-19 IVS RNA) and which has been extensively described by Thomas Cech and collaborators (Zaug *et al.*, 1984, Science, *224*:574-578; Zaug and Cech, 1986, Science, *231*:470-475; Zaug *et al.*, 1986, Nature, *324*:429-433; published International Patent Application No. WO 88/04300 by University Patents Inc.; Been and Cech, 1986, Cell, *47*:207-216). The Cech-type ribozymes have an eight base pair active site which hybridizes to a target RNA sequence where after cleavage of the target RNA takes place. The invention encompasses those Cech-type ribozymes which target eight base-pair

active site sequences that are present in the mRNAs specific for the peptides and proteins of interest of the current invention.

As in the antisense approach, the ribozymes can be composed of modified oligonucleotides (*e.g.* for improved stability, targeting, etc.) and should be delivered to cells which express the peptides and proteins of interest of the current invention *in vivo*, like, for example, ES cells. A preferred method of delivery involves using a DNA construct "encoding" the ribozyme under the control of a strong constitutive pol III or pol II promoter, so that transfected cells will produce sufficient quantities of the ribozyme to destroy the endogenous messages specific for the peptides and proteins of interest of the current invention and inhibit translation. Because ribozymes unlike antisense molecules, are catalytic, a lower intracellular concentration is required for efficiency.

Endogenous gene expression can also be reduced by inactivating or "knocking out" the gene of interest specific for a peptide or protein of the current invention or its promoter using targeted homologous recombination. (*e.g.*, see Smithies *et al.*, 1985, Nature *317*:230-234; Thomas & Capecchi, 1987, Cell *51*:503-512; Thompson *et al.*, 1989 Cell *5*:313-321; each of which is incorporated by reference herein in its entirety). For example, a mutant, non-functional peptide or protein of interest of the current invention (or a completely unrelated DNA sequence) flanked by DNA homologous to the endogenous gene encoding said peptide or protein of interest of the current invention (either the coding regions or regulatory regions of the gene) can be used, with or without a selectable marker and/or a negative selectable marker, to transfect cells that express said peptide or protein of interest of the current invention *in vivo*. Insertion of the DNA construct, via targeted homologous recombination, results in inactivation of the targeted endogenous gene. Such approaches are particularly suited in the agricultural field where modifications to ES cells can be used to generate animal offspring with an inactive copy of a gene encoding a peptide or protein of interest of the current invention (*e.g.*, see Thomas & Capecchi 1987 and Thompson 1989, supra). However this approach can be adapted for use in humans provided the recombinant DNA constructs are directly administered or targeted to the required site *in vivo* using appropriate viral vectors.

Alternatively, endogenous expression of a gene of interest can be reduced by targeting deoxyribonucleotide sequences complementary to the regulatory region of said gene (*i.e.*, the promoter and/or enhancers) to form triple helical structures that prevent transcription of the gene of interest in target cells in the body. (See generally, Helene, C. 1991, Anticancer Drug Des., *6(6)*:569-84; Helene, C. *et al.*, 1992, Ann, N.Y. Acad. Sci., *660*:27-36; and Maher, L.J., 1992, Bioassays *14(12)*:807-15).

In yet another embodiment of the invention, the activity of a peptide or protein of interest of the current invention can be reduced using a "dominant negative" approach. A dominant negative approach takes advantage of the interaction of the peptides or proteins of interest with other peptides or proteins to form complexes, the formation of which is a prerequisite for the peptide or protein of interest of the current invention to exert its physiological activity. To this end, constructs which encode a defective form of the peptide or protein of interest of the current invention can be used in gene therapy approaches to diminish the activity of said peptide or protein of interest in appropriate target cells. Alternatively, targeted homologous recombination can be utilized to introduce such deletions or mutations into the subject's endogenous gene encoding the peptide or protein of interest of the current invention in the appropriate tissue. The engineered cells will express non-functional copies of the peptide or protein of interest of the current invention, thereby downregulating its activity *in vivo*. Such engineered cells should demonstrate a diminished response to physiological stimuli of the activity of the affected peptide or protein of interest of the current invention, resulting in reduction of the development or cell differentiation disorder phenotype.

5.7.2 RESTORATION OR INCREASE IN EXPRESSION OR ACTIVITY OF A PEPTIDE OR PROTEIN OF THE CURRENT INVENTION TO PROMOTE DEVELOPMENT OR CELL DIFFERENTIATION

With respect to an increase in the level of normal gene expression and/or gene product activity specific for any of the peptides and proteins of interest of the current invention, the respective nucleic acid sequences can be utilized for the treatment of development and cell differentiation disorders. Where the cause of the development or cell differentiation

dysfunction is a defective peptide or protein of the current invention, treatment can be administered, for example, in the form of gene delivery or gene therapy. Specifically, one or more copies of a normal gene or a portion of the gene that directs the production of a gene product exhibiting normal function of the appropriate peptide or protein of the current invention, may be inserted into the appropriate cells within a patient or animal subject, optionally using suitable vectors. Recombinant retroviruses have been widely used in gene transfer or gene delivery experiments and even human clinical trials (see generally, Mulligan, R.C., Chapter 8, In: Experimental Manipulation of Gene Expression, Academic Press, pp. 155-173 (1983); Coffin, J., In: RNA Tumor Viruses, Weiss, R. *et al.* (eds.), Cold Spring Harbor Laboratory, Vol. 2, pp. 36-38 (1985). Other eucaryotic viruses which have been used as vectors to transduce mammalian cells include adenovirus, papilloma virus, herpes virus, adeno-associated virus, vaccinia virus, rabies virus, and the like (See generally, Sambrook *et al.*, Molecular Cloning, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York, Vol. *3*:16.1-16.89 (1989). Alternatively, cationic or other lipids may be employed to deliver polynucleotides comprising (or including) the described GTS sequences to patients. Additionally, naked DNA comprising one or more GTS sequences, optionally modified by the addition of one or more of, in operable combination and orientation, a promoter, an enhancer, a ribosome entry or ribosome binding site, and/or an in-frame translation initiation codon can be employed to deliver GTSs to a patient. Another use of the above constructs includes "naked" DNA vaccines that can be introduced *in vivo* alone, or in conjunction with excipients, or microcarrier spheres, nanoparticles or other supporting or dosaging compounds or molecules.

The gene replacement/delivery therapies described above should be capable of delivering gene sequences to the cell types within patients which express the peptide or protein of interest of the current invention. Alternatively, targeted homologous recombination can be utilized to correct the defective endogenous gene in the appropriate cell type. In animals, targeted homologous recombination can be used to correct the defect in ES cells in order to generate offspring with a corrected trait.

Finally, compounds identified in the assays described above that stimulate, enhance, or modify the activity of the peptides and proteins of the current invention can be used to

achieve proper development and cell differentiation. The formulation and mode of administration will depend upon the physico-chemical properties of the compound.

5.8 PHARMACEUTICAL PREPARATIONS AND METHODS OF ADMINISTRATION

Compounds that are determined to affect gene expression of the peptides and proteins of the current invention, comprise nucleotide sequence information that is at least partially first disclosed in the Sequence Listing (*i.e.*, sequences used in antisense, gene therapy, dsRNA, or ribozyme applications), or the interaction of such peptides and proteins with any of their binding partners, can be administered to a patient at therapeutically effective doses to treat or ameliorate development and cell differentiation disorders. A therapeutically effective dose refers to that amount of the compound sufficient to result in any amelioration or retardation of disease symptoms, or development and cell differentiation or proliferation disorders.

5.8.1 EFFECTIVE DOSE

Toxicity and therapeutic efficacy of such compounds can be determined by standard pharmaceutical procedures in cell cultures or experimental animals, *e.g.*, for determining the LD_{50} (the dose lethal to 50% of the population) and the ED_{50} (the dose therapeutically effective in 50% of the population). The dose ratio between toxic and therapeutic effects is the therapeutic index and it can be expressed as the ratio LD_{50}/ED_{50}. Compounds which exhibit large therapeutic indices are preferred. While compounds that exhibit toxic side effects may be used, care should be taken to design a delivery system that targets such compounds to the site of affected tissue in order to minimize potential damage to uninfected cells and, thereby, reduce side effects.

The data obtained from the cell culture assays and animal studies can be used in formulating a range of dosage for use in humans. The dosage of such compounds lies preferably within a range of circulating concentrations that include the ED_{50} with little or no toxicity. The dosage may vary within this range depending upon the dosage form employed and the route of administration utilized. For any compound used in the method of the

invention, the therapeutically effective dose can be estimated initially from cell culture assays. A dose may be formulated in animal models to achieve a circulating plasma concentration range that includes the IC_{50} (*i.e.*, the concentration of the test compound which achieves a half-maximal inhibition of symptoms) as determined in cell culture. Such information can be used to more accurately determine useful doses in humans. Levels in plasma may be measured, for example, by high performance liquid chromatography.

When the therapeutic treatment of disease is contemplated, the appropriate dosage may also be determined using animal studies to determine the maximal tolerable dose, or MTD, of a bioactive agent per kilogram weight of the test subject. In general, at least one animal species tested is mammalian. Those skilled in the art regularly extrapolate doses for efficacy and avoiding toxicity to other species, including human. Before human studies of efficacy are undertaken, Phase I clinical studies in normal subjects help establish safe doses.

Additionally, the bioactive agent may be complexed with a variety of well established compounds or structures that, for instance, enhance the stability of the bioactive agent, or otherwise enhance its pharmacological properties (e.g., increase *in vivo* half-life, reduce toxicity, etc.).

The above therapeutic agents will be administered by any number of methods known to those of ordinary skill in the art including, but not limited to, administration by inhalation; by subcutaneous (sub-q), intravenous (I.V.), intraperitoneal (I.P.), intramuscular (I.M.), or intrathecal injection; or as a topically applied agent (transderm, ointments, creams, salves, eye drops, and the like).

5.8.2 FORMULATIONS AND USE

Pharmaceutical compositions for use in accordance with the present invention may be formulated in conventional manner using one or more physiologically acceptable carriers or excipients.

Thus, the compounds and their physiologically acceptable salts and solvates may be formulated for administration by inhalation or insufflation (either through the mouth or the nose) or oral, buccal, parenteral or rectal administration.

For oral administration, the pharmaceutical compositions may take the form of, for example, tablets or capsules prepared by conventional means with pharmaceutically acceptable excipients such as binding agents (*e.g.*, pregelatinised maize starch, polyvinylpyrrolidone or hydroxypropyl methylcellulose); fillers (*e.g.*, lactose, microcrystalline cellulose or calcium hydrogen phosphate); lubricants (*e.g.*, magnesium stearate, talc or silica); disintegrants (*e.g.*, potato starch or sodium starch glycolate); or wetting agents (*e.g.*, sodium lauryl sulphate). The tablets may be coated by methods well known in the art. Liquid preparations for oral administration may take the form of, for example, solutions, syrups or suspensions, or they may be presented as a dry product for constitution with water or other suitable vehicle before use. Such liquid preparations may be prepared by conventional means with pharmaceutically acceptable additives such as suspending agents (*e.g.*, sorbitol syrup, cellulose derivatives or hydrogenated edible fats); emulsifying agents (*e.g.*, lecithin or acacia); non-aqueous vehicles (*e.g.*, almond oil, oily esters, ethyl alcohol or fractionated vegetable oils); and preservatives (*e.g.*, methyl or propyl-p-hydroxybenzoates or sorbic acid). The preparations may also contain buffer salts, flavoring, coloring and sweetening agents as appropriate.

Preparations for oral administration may be suitably formulated to give controlled release of the active compound.

For buccal administration the compositions may take the form of tablets or lozenges formulated in conventional manner.

For administration by inhalation, the compounds for use according to the present invention are conveniently delivered in the form of an aerosol spray presentation from pressurized packs or a nebulizer, with the use of a suitable propellant, *e.g.*, dichlorodifluoromethane, trichlorofluoromethane, dichlorotetrafluoroethane, carbon dioxide or other suitable gas. In the case of a pressurized aerosol, the dosage unit may be determined by providing a valve to deliver a metered amount. Capsules and cartridges of *e.g.* gelatin for use in an inhaler or insufflator may be formulated containing a powder mix of the compound and a suitable powder base such as lactose or starch.

The compounds may be formulated for parenteral administration by injection, *e.g.*, by bolus injection or continuous infusion. Formulations for injection may be presented in unit

dosage form, *e.g.*, in ampules or in multi-dose containers, with an added preservative. The compositions
may take such forms as suspensions, solutions or emulsions in oily or aqueous vehicles, and may contain formulatory agents such as suspending, stabilizing and/or dispersing agents. Alternatively, the active ingredient may be in powder form for constitution with a suitable vehicle, *e.g.*, sterile pyrogen-free water, before use.

The compounds may also be formulated as compositions for rectal administration such as suppositories or retention enemas, *e.g.*, containing conventional suppository bases such as cocoa butter or other glycerides.

In addition to the formulations described previously, the compounds may also be formulated as a depot preparation. Such long acting formulations may be administered by implantation (for example subcutaneously or intramuscularly) or by intramuscular injection. Thus, for example, the compounds may be formulated with suitable polymeric or hydrophobic materials (for example as an emulsion in an acceptable oil) or ion exchange resins, or as sparingly soluble derivatives, for example, as a sparingly soluble salt. The compositions may, if desired, be presented in a pack or dispenser device which may contain one or more unit dosage forms containing the active ingredient. The pack may, for example, comprise metal or plastic foil, such as a blister pack. The pack or dispenser device may be accompanied by instructions for administration.

The examples below are provided to illustrate the subject invention. These examples are provided by way of illustration and are not included for the purpose of limiting the invention in any way whatsoever.

6. EXAMPLES

6.1 CONSTRUCTION OF TRAPPED cDNA LIBRARIES

The GTSs represented in SEQ ID NOS:9-1008 were generated using normalized cDNA libraries produced as described in U.S. application Ser. No. 60/095,989, filed August 10, 1998 entitled "Construction of Normalized cDNA Libraries From Animal Cells" (also identified as attorney docket no. 8535-021-888), by Nehls *et al.*, the disclosure of which is herein incorporated by reference in its entirety.

Figure 1A provides a representative illustration of the retroviral vector used to produce the described polynucleotides. In brief, pools of modified human PA-1 teratocarcinoma cells (*e.g.*, PA-2, PA-1 that has been transfected to express the murine ecotropic retrovirus receptor) were typically infected at an m.o.i. between about 0.01 and about 0.1 (although much higher m.o.i.'s such as 1 to more than 10 could have been used). Figure 1B schematically shows how the target cell genomic locus is presumably mutated by the integration of the retroviral construct into intronic sequences of the cellular gene. The integrated retrovirus results in the generation of two chimeric transcripts. As illustrated in Figure 1C, the first chimeric transcript is a fusion between the coding region of the resistance marker (*neo* was used to produce the presently described GTSs) carried within the transgenic construct and the downstream exon(s) from the cellular gene. A mature transcript is generated when the indicated splice donor (SD) and splice acceptor (SA) sites are spliced. Translation of this fusion transcript produces the protein encoded by the resistance marker and allows for selection of gene trapped target cells, although selection is not required to produce the described polynucleotides.

Another chimeric transcript is shown in Figure 1C. This transcript is a fusion between the first exon of the transgenic construct (EXON1- the first exon of the murine *btk* gene was used as the sequence acquisition component for the described GTSs) and downstream exons from the cellular genome. Unlike the transcript encoding the selectable marker exon, the transcript encoding EXON1 is transcribed under the control of a vector encoded, and hence exogenously added, promoter (such as the PGK promoter), and the corresponding mRNA is generated by splicing between the indicated SD and SA sites. The region encoding the sequence acquisition exon (EXON1) has also been engineered to incorporate a unique sequence that permits the selective enrichment of the fusion transcript using molecular biological methods such as, for example, the polymerase chain reaction (PCR). These sequences serve as unique primer binding sites for EXON1-specific PCR amplification of the transcript and can additionally incorporate one or several rare-cutter endonuclease restriction sites to allow site-specific cloning. These features allow for the efficient and preferential cloning of transgene expressed fusion transcripts from pools of target cells relative to the background of cellularly encoded transcripts.

Based on the unique sequence present in EXON1, that is schematically indicated as a rare-cutter (A) restriction site in Figure 1B, selective cloning of the fusion transcript is achieved as shown in Figure 1D. cDNA was generated by reverse transcribing isolated RNA from pools of cells that have undergone independent gene trap events using, for example, RTT-1 as a deoxyoligonucleotide primer. The 3' end of the RTT-1 primer consisted of a homopolymeric stretch of deoxythymidine residues that bound to the polyadenylated end of the mRNA. At its 5' end, the oligonucleotide contained a sequence that can serve as a binding site for a second and a third primer (GET-2 and GET-2N). In the center, RTT-1 contains the sequence of a second rare-cutter (B) restriction site. Depending on the size of the pool and the transcriptional levels of the fusion transcript, second strand synthesis was carried out either with deoxyoligonucleotide primer BTK-1 using Klenow polymerase or by a polymerase chain reaction (PCR) in the presence of primers BTK-1 and GET-2.

The second strand reaction products that were generated by PCR were digested with restriction endonucleases that recognize their corresponding restriction site (*e.g.*, A and B). Additionally, PCR conditions were suitably modified using a variety of established procedures for enhancing the size of the PCR products. Such methods are described, inter alia, in U.S. Patent No. 5,556,772, and/or the PanVera (Madison, WI) New Technologies for Biomedical Research catalog (1997/98) both of which are herein incorporated by reference.

Prior to cloning, the PCR cDNA fragments were size-selected using conventional methods such as, for example, chromatography, gel-electrophoresis, and the like. Alternatively or in addition to this size selection, the PCR templates could have been previously size selected into separate template pools.

After digestion with suitable restriction enzymes, and size selection as described above, the cleaved cDNAs were directionally cloned into phage vectors (see Figure 1D), although any other cloning vector/vehicle could have been used. Such vectors are generically referred to as gene trapped sequence vectors, or "GTS vectors" in Figure 1D), preferably incorporating a multiple cloning site with restriction sites corresponding to those incorporated into the amplified cDNAs (*e.g.*, *Sfi* I, which allows for directional cloning of the cDNAs). After cloning, the resulting phage were handled as a conventional cDNA library using

standard procedures. Individual colonies and/or plaques were picked and used to generate PCR derived (using the primers indicated below) templates for DNA sequencing reactions.

A more detailed description of the above follows. The *btk* gene trap vector was introduced into human PA-2 cells using standard techniques. In brief, vector/virus containing supernatant from GP+E or AM12 packaging cells was added to approximately 50,000 cells (at an input ratio between about 0.1 and about 0.1 virus/target cell) for between about 16 to about 24 hours, and the cells were subsequently selected with G418 at active concentration of about 400 micrograms/ml for about 10 days. Between about 600 and about 3,000 G418 resistant colonies were subsequently pooled, and subjected to RNA isolation, reverse transcription, PCR, restriction digestion, size selection, and subcloning into lambda phage vectors. Individual phage plaques were directly amplified, purified, and sequenced to obtain the corresponding GTS.

When selection is not used, about 1 x 10^6 cells (PA-2, Hela, HepG2, or Jurkatt cells) per 100 mm dish were plated and infected with AM12 packaged *btk* retrovirus at an m.o.i. of approximately .01. After a 16 h incubation, the cells were washed in PBS and grown in culture media for four days. RNA from each plate was extracted, reverse transcribed, and the resulting cDNA was subject to two rounds of PCR, each for 25 cycles. The resulting PCR products were digested with Sfi and separated by gel electrophoresis. Six size fractions (between about 300 and about 4,000 bp) were recovered and each fraction was ligated into lambdaGT10Sfi arms, *in vitro* packaged, and plated for lysis. Individual plaques were picked from the plates, subject to an additional round of PCR, and subsequently sequenced to obtain the described GTSs. The particulars are described in greater detail below.

Figure 1 shows the chimeric fusion transcript that is formed when the first exon of the transgenic construct (EXON1- the first exon of the murine *btk* gene was used as the sequence acquisition component for the described GTSs) is spliced to downstream exons from the cellular genome. Unlike the transcript encoding the selectable marker exon, the transcript encoding EXON1 is transcribed under the control of a vector encoded, and hence exogenously added, promoter (such as the PGK promoter), and the corresponding mRNA is generated by splicing between the indicated SD and SA sites. The region encoding the sequence acquisition exon (EXON1) has also been engineered to incorporate a unique

sequence that permits the selective enrichment of the fusion transcript using molecular biological methods such as, for example, the polymerase chain reaction (PCR). These sequences serve as unique primer binding sites for EXON1-specific PCR amplification of the transcript and can additionally incorporate one or several rare-cutter endonuclease restriction sites to allow site-specific cloning. These features allow for the efficient and preferential cloning of transgene expressed fusion transcripts from pools of target cells relative to the background of cellularly encoded transcripts.

Based on the unique sequence present in EXON1, that is schematically indicated as a rare-cutter (A) restriction site in Figure 1B, selective cloning of the fusion transcript is achieved as shown in Figure 1D. cDNA was generated by reverse transcribing isolated RNA from pools of cells that have undergone independent gene trap events using, for example, RTT-1 as a deoxyoligonucleotide primer. The 3' end of the RTT-1 primer consisted of a homopolymeric stretch of deoxythymidine residues that bound to the polyadenylated end of the mRNA. At its 5' end, the oligonucleotide contained a sequence that can serve as a binding site for a second and a third primer (GET-2 and GET-2N). In the center, RTT-1 contains the sequence of a second rare-cutter (B) restriction site. Depending on the size of the pool and the transcriptional levels of the fusion transcript, second strand synthesis was carried out either with deoxyoligonucleotide primer BTK-1 using Klenow polymerase or by a polymerase chain reaction (PCR) in the presence of primers BTK-1 and GET-2.

The second strand reaction products that were generated by PCR were digested with restriction endonucleases that recognize their corresponding restriction site (*e.g.*, A and B). Additionally, PCR conditions were suitably modified using a variety of established procedures for enhancing the size of the PCR products. Such methods are described, inter alia, in U.S. Patent No. 5,556,772, and/or the PanVera (Madison, WI) New Technologies for Biomedical Research catalog (1997/98) both of which are herein incorporated by reference.

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After digestion with suitable restriction enzymes, and size selection as described above, the cleaved cDNAs were directionally cloned into phage vectors (see Figure 1D), although any other cloning vector/vehicle could have been used. Such vectors are generically referred to as gene trapped sequence vectors, or "GTS vectors" in Figure 1D), preferably incorporating a multiple cloning site with restriction sites corresponding to those incorporated into the amplified cDNAs (*e.g.*, *Sfi* I, which allows for directional cloning of the cDNAs). After cloning, the resulting phage were handled as a conventional cDNA library using standard procedures. Individual colonies and/or plaques were picked and used to generate PCR derived (using the primers indicated below) templates for DNA sequencing reactions.

Total cell RNA isolation was conducted using RNAzol (Friendswood, TX, 77546) per the manufacturer's specifications. An RT premix containing 2X First Strand buffer, 100mM Tris-HCl, pH 8.3, 150mM KCl, 6mM $MgCl_2$, 2mM dNTPs, RNAGuard (1.5 units/reaction, Pharmacia), 20mM DTT, RTT-1 primer (3pmol/rxn, GenoSys Biotechnologies, sequence: 5' tggctaggccccaggataggcctcgctggcctttttttttttttttt 3', SEQ ID NO:1) and Superscript II enzyme (200 units/rxn, Life Technologies) was added. The plate/tube was transferred to a thermal cycler for the RT reaction (37° C for 5 min. 42° C for 30 min. and 55° C for 10 min).

The cDNA was amplified using two distinct, and preferably nested, stages of PCR. The PCR premix contained: 1.1X MGBII buffer (74 mM Tris pH 8.8, 18.3mM Ammonium Sulfate, 7.4mM $MgCl_2$, 5.5mM 2ME, 0.011% Gelatin), 11.1% DMSO (Sigma), 1.67mM τdNTPS, Taq (5 units/rxn), water and primers. The sequences of the first round primers are: BTK-1 5' gccatggctccggtaggtccagag 3', SEQ ID NO:2 (GET-2, 5' tggctaggccccaggatag 3', SEQ ID NO:3), (about 7 pmol/rxn). The sequences of the second round primers are BTK-4 5' gtccagagatggccatagc 3', SEQ ID NO:4 (GET-2N 5' ccaggataggcctcgctg 3', SEQ ID NO:5), (used at about 20 pmol/rxn). The outer premix was added to an aliquot of cDNA and run for 20 cycles (94° C for 45 sec., 56° C for 60 sec 72° C for 2-4 min). An aliquot of this product was added to the inner premix and cycled at the same temperatures 20 times.

The PCR products of the second amplification series were extracted using phenol/chloroform, chloroform, and isopropanol precipitated in the presence of glycogen/sodium acetate. After centrifugation, the nucleic acid pellets were washed with 70 percent ethanol and were resuspended in TE, pH 8. After digestion with *Sfi* I at 55° C, the

digested products were loaded onto 0.8% agarose gels and size-selected using DEAE membranes as described (Sambrook *et al.*, 1989, *supra*). Generally, six approximate size-fractions (<700 bp, 700-900 bp, 900-1,300 bp, 1,300-1,600 bp, 1,600-2,000 bp, >2,000 bp) were separately ligated into GTS vector arms that were engineered to contain the corresponding *Sfi* I "A" and "B" specific overhangs (*i.e.*, TAG and GCG, respectively). The ligation products were packaged using commercially available lambda packaging extracts (Promega), and plated using *E. coli* strain C600 using conventional procedures (Sambrook *et al.*, 1989, *supra*). Individual plaques were directly picked into 40 microliters of PCR buffer and subjected to 35 cycles of PCR [at 94° C for 45 sec., 56° C for 60 sec 72° C for 1-3 min (depending on the size fraction)] using 12 pmol of the primers SEQ-4, 5' tacagtttttcttgtgaagattg 3', SEQ ID NO:6 and SEQ-5, 5' gggtagtccccaccttttg 3', SEQ ID NO:7, per PCR reaction. The cloned 3' RACE products were purified using an S300 column equilibrated in STE essentially as described in Nehls *et al.,* 1993, TIG,*9*:336-337, and the products were recovered by centrifugation at 1,200 x g for 5 min. This step removes unincorporated nucleotides, oligonucleotides, and primer-dimers. The PCR products were subsequently applied to a 0.25 ml bed of Sephadex® G-50 (DNA Grade, Pharmacia Biotech AB) that was equilibrated in MilliQ H_2O, and recovered by centrifugation as described above. Purified PCR products were quantified by fluorescence using PicoGreen (Molecular Probes, Inc., Eugene, OR) as per the manufacturer's instructions.

Dye terminator cycle sequencing reactions with AmpliTaq® FS DNA polymerase (Perkin Elmer Applied Biosystems, Foster City, CA) were carried out using 7 pmoles of primer (Oligonucleotide BTK-3; 5' tccaagtcctggcatctcac 3', SEQ ID NO:8) and approximately 30-120 ng of 3' template. Unincorporated dye terminators were removed from the completed sequencing reactions using G-50 columns as described above. The reactions were dried under vacuum, resuspended in loading buffer, and electrophoresed through a 6% Long Ranger acrylamide gel (FMC BioProducts, Rockland, ME) on an ABI Prism® 377 with XL upgrade as per the manufacturer's instructions. The sequences of the amplicons, or GTSs, are described in SEQ ID NOS:9-1008.

All publications and patents mentioned in the above specification are herein incorporated by reference. Various modifications and variations of the described method and

system of the invention will be apparent to those skilled in the art without departing from the scope and spirit of the invention. Although the invention has been described in connection with specific preferred embodiments, it should be understood that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the above-described modes for carrying out the invention which are obvious to those skilled in the field of molecular biology or related fields are intended to be within the scope of the following claims.

CLAIMS

WHAT IS CLAIMED IS:

1. An oligonucleotide comprising a contiguous stretch of at least about 15 nucleotides first disclosed in at least one of SEQ ID NOS:9-1008.

2. An isolated cDNA polynucleotide derived from the genome of a human that is capable of hybridizing to a sequence first disclosed in at least one of SEQ ID NOS:9-1008 under stringent conditions.

3. An isolated polynucleotide comprising a contiguous stretch of at least about 60 nucleotides first disclosed in at least one of SEQ ID NOS:9-1008.

4. The isolated polynucleotide according to Claim 3, wherein said polynucleotide sequence comprises at least one of SEQ ID NOS:9-1008.

5. An *in vitro* process for producing a polynucleotide comprising the steps of:

a) obtaining a polynucleotide template encoding a sequence capable of hybridizing to a GTS of SEQ ID NOS:9-1008;

b) combining said template with a synthetic oligonucleotide sequence of about 14 to about 80 bases in length that comprises a contiguous sequence of at least about 12 nucleotides disclosed in one of SEQ ID NOS:9-1008; and

c) processing the combined oligonucleotide and template preparation such that said oligonucleotide sequence hybridizes to said template in the presence of a DNA polymerase molecule and a sufficient concentration of dNTPs for said oligonucleotide sequence to prime DNA synthesis by said polymerase,

wherein a polynucleotide is produced that encodes at least about 50 contiguous nucleotides first disclosed in one of SEQ ID NOS:9-1008.

6. The process of Claim 5 wherein said template is mammalian cDNA.

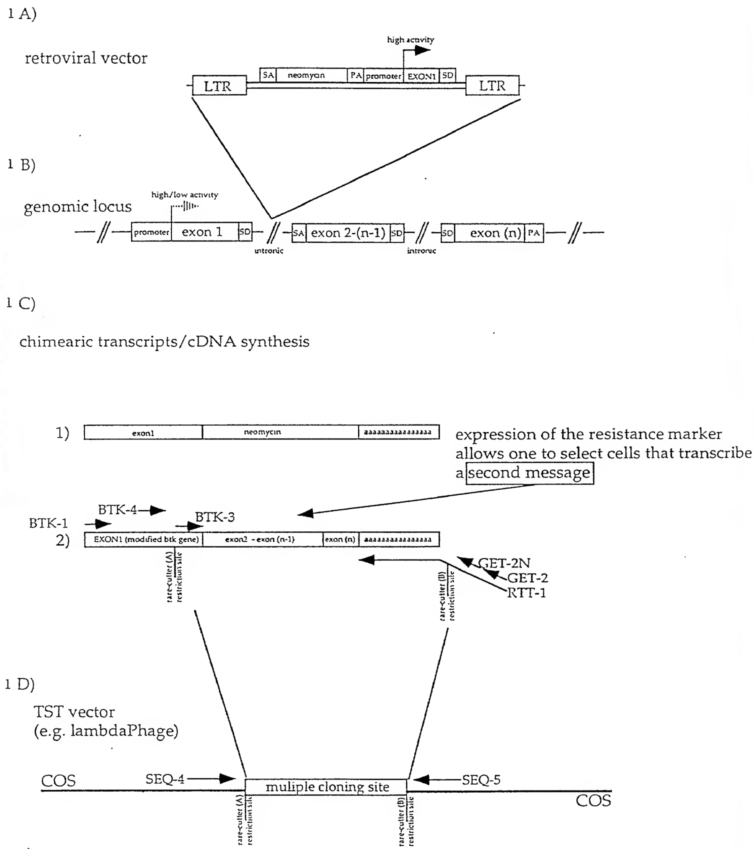
7. The process of Claim 5 wherein said template is mammalian genomic DNA.

8. The process according to Claim 6 wherein said templates are of human origin.

9. The process according to Claim 7 wherein said templates are of human origin.

ABSTRACT

Novel human polynucleotides are disclosed that correspond to human gene trapped sequences, or GTSs. The disclosed GTSs are useful for gene discovery and as markers for, *inter alia*, gene expression analysis, forensic analysis, and determining the genetic basis of human disease.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(e.g. lambdaPhage)
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muliple cloning site
SEQ-5
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rare-cutter (B) restriction site

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below at 201 et seq. underneath my name.

I believe I am the original, first and sole inventor if only one name is listed at 201 below, or an original, first and joint inventor if plural names are listed at 201 et seq. below, of the subject matter which is claimed and for which a patent is sought on the invention entitled

NOVEL HUMAN POLYNUCLEOTIDES AND THE POLYPEPTIDES ENCODED THEREBY

and for which a patent application:
☒ is attached hereto and includes amendment(s) filed on *(if applicable)*
☐ was filed in the United States on as Application No. *(for declaration not accompanying application)*
with amendment(s) filed on *(if applicable)*
☐ was filed as PCT international Application No. on and was amended under PCT Article 19 on *(if applicable)*

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED PRIOR TO THE FILING DATE OF THE APPLICATION			
APPLICATION NUMBER	COUNTRY	DATE OF FILING (day, month, year)	PRIORITY CLAIMED
			YES ☐ NO ☐
			YES ☐ NO ☐

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

APPLICATION NUMBER	FILING DATE
60/106,442	October 30, 1998

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NO.	FILING DATE	STATUS		
		PATENTED	PENDING	ABANDONED

POWER OF ATTORNEY. As a named inventor, I hereby appoint S. Leslie Misrock (Reg. No. 18872), Harry C Jones, III (Reg No. 20280), Berj A Terzian (Reg. No. 20060), Gerald J Flintoft (Reg No. 20823), David Weild, III (Reg. No 21094), Jonathan A. Marshall (Reg. No. 24614), Barry D. Rein (Reg. No. 22411), Stanton T. Lawrence, III (Reg. No. 25736), Charles E. McKenney (Reg. No. 22795), Philip T. Shannon (Reg No 24278), Francis E Morris (Reg No 24615), Charles E. Miller (Reg. No. 24576), Gidon D Stern (Reg. No 27469), John J. Lauter, Jr. (Reg. No 27814), Brian M. Poissant (Reg. No 28462), Brian D. Coggio (Reg. No. 27624), Rory J. Radding (Reg. No 28749), Stephen J. Harbulak (Reg. No. 29166), Donald J. Goodell (Reg. No. 19766), James N. Palik (Reg. No. 25510), Thomas E. Friebel (Reg. No. 29258), Laura A Coruzzi (Reg No 30742), Jennifer Gordon (Reg. No. 30753), Jon R. Stark (Reg No. 30111), Allan A. Fanucci (Reg. No. 30256), Geraldine F. Baldwin (Reg. No. 31232), Victor N Balancia (Reg. No. 31231), Samuel B. Abrams (Reg. No. 30605), Steven I. Wallach (Reg No 35402), Marcia H. Sundeen (Reg No. 30893), Paul J Zegger (Reg. No 33821), Edmond R Bannon (Reg. No. 32110), Bruce J Barker (Reg. No. 33291), Adriane M. Antler (Reg. No. 32605), Thomas G. Rowan (Reg No 34419), James G Markey (Reg. No. 31636), Thomas D. Kohler (Reg. No. 32797), Scott D Stimpson (Reg No. 33607), Gary S. Williams (Reg No 31066), William S. Galliani (Reg. No. 33885), Ann L Gisolfi (Reg. No. 31956), Todd A. Wagner (Reg. No. 35399), Scott B Familant (Reg No. 35504), Warren S. Heit (Reg. No. 36828), Kelly D. Talcott (Reg. No. 39582), and Mark A. Farley (Reg. No. 33170) and, all of Pennie & Edmonds LLP, whose addresses are 1155 Avenue of the Americas, New York, New York 10036, 1667 K Street N W., Washington, DC 20006 and 3300 Hillview Avenue, Palo Alto, CA 94304, and each of them, my attorneys, to prosecute this application, and to transact all business in the Patent and Trademark Office connected therewith

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF MICHAEL NEHLS (201)	SIGNATURE OF BRIAN ZAMBROWICZ (202)	SIGNATURE OF ARTHUR T SANDS (203)
DATE	DATE	DATE

SEQUENCE LISTING

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Zambrowicz, Brian
Sands, Arthur T.

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Polypeptides Encoded Thereby

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ccctttgctg actctctttt cggactcagc ccgcctgcac ccaggtgaaa taaacagcct 360
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<210> 14
<211> 344
<212> DNA
<213> Homo sapiens

<400> 14
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agatcttggc tcactgcaac ctccacctcc caggtttaag tgattctcct gcctcagcct 180
cccaagtagc tgggattaca ggaagaaaaa tggaactaaa aagggaaaac aatagcaaca 240
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agcattgtca tttggggtga attgcagaaa gaaataaatt attg 344

<210> 15
<211> 473
<212> DNA
<213> Homo sapiens

<400> 15
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gctgtgctaa gagcagttct aggacagatg aggagacaac tgttctgccc ggggctaagg 180
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tacctcttct caggggtctc tcttctctcc tattaacttc tttccatttc cctnattaag 420
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<210> 16
<211> 403
<212> DNA
<213> Homo sapiens

<400> 16
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ccagctattt caatggacca acaaagtgag actccaaagt gagccaagaa gtcctcaaag 180
cccttcctaa aggatggagg aacacatgaa tatatacatc aaatcctcct tccacagaga 240
ctcactgaag ggaatgaaga agggaaaagt cctcctaatt attaagatgc gttccttggg 300
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<210> 17
<211> 445
<212> DNA
<213> Homo sapiens

<400> 17
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ctgcctcagc ctcccaaagt gctgcgatta aaggcacaag ccactgtgcc caaccaaagg 120
gtcttgctct gtcgcccagg ctagagtgca gtggcgcaat cttggctcat ggcaacctcc 180
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cctaccacca ggcccagcta aattttttttg tatttttagt acagacgggg tttcgccacc 300
ttggccaggc tggtcttgaa ctcctgacct tgtgatctac ccacctnagn ntcccaangg 360
gctggnatta caggggggag agaccggacc cagccacctt actgngtttc tgantgnnnt 420
ttcctttcct ttccttttcc cttaa 445

<210> 18
<211> 486
<212> DNA
<213> Homo sapiens

<400> 18
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gtcttgctct gtcgcccagg ctagagtgca gtggcgcaat cttggctcat ggcaacctcc 180
acctcccggg ttcaagcgat tctcctgcca cagcctcccg agtagctggg attacaggtg 240
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ctgggattac aggtgtgaga gaccgcaccc aggcacctta ctgaggttct gaatgntctt 420
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tggcta 486

<210> 19
<211> 443
<212> DNA
<213> Homo sapiens

<400> 19
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nntgcggaac ttagaaacag agnttcacca tgttggccaa gatggnctng atntcctgac 120
ctcgtgatcc gcccacctca gcctcccaaa gtgctgggat tacaggcacg aaccactgcg 180
cccggcccaa aatgaaagga gccccaggcc tctcaaaaag tatgaaagaa ctggaattca 240
ccagatcatc acatccagac aatgagacac caggcccctc attcatcatg atggcttctt 300
taccccctatg gagttcctgt tttcccttag atagttacat ttcttccctg ctatataaac 360
ccctaatttt aagtcaatcc cgaagacgga tttgagcttc aagcttccat cttctttggc 420
tgnagaacct ggttaaaggc ctt 443

<210> 20
<211> 360
<212> DNA
<213> Homo sapiens

<400> 20
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tgggattaca ggtgtgagcc actgcacctg gcttagaaat cttttcattc tttcaacatg 180
aatcctgctc ttagaatcac agagtacaaa gcttcctggt acaggtgggg aaactgaggc 240
tccgagttgc ctatctgatt ctgaggacac agcacccccc accagcacac ctggcacttg 300
ctttgtatat tagtgtcatt cggcacaagt tagtggaaaa tannagcata atatatagct 360

<210> 21
<211> 212
<212> DNA
<213> Homo sapiens

<400> 21
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cttcagaatg agagaagata tgccaaagac tttttatcta tacctgttcc tgttatgatg 120

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atgaaatcct ggactactag actgaatctg ataccaaaat tggaagagtt tttgggtatc      180
ttgggagagg acattttggt tgtgcttgca tt                                    212

       <210> 22
       <211> 456
       <212> DNA
       <213> Homo sapiens

       <400> 22
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tagagaanat ggctagggta gagcacacaa ggagagcagg ttcagggaga gatgaagatg      120
agaccaaagc gggaagagtg aagggaaaat taacctcccc ttgctgagac gtgtgacact      180
caaggcccaa atcagaaaac ttctgcttga ggaaacatta ctctttcctc catgactgct      240
ggtggtatcc atctgtcaga ctccctgagc cttgatgccc ctcactcctt ctgctgtgga      300
gtaggaacgt gaaacacaaa cagtcatccc tccaattcct ccaacccatg gggattggn       360
tccatgancc ctaacaaaat accaaatttc atggatgttc aagtccctta ttgcaaatgg      420
gcatggtatt tgcatataac ccgatgcaca tccccc                                456

       <210> 23
       <211> 350
       <212> DNA
       <213> Homo sapiens

       <400> 23
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ggattgttga gctgaagaca attaagaaga aacagatgca ggaaagctct ctgccctcca      120
tttgcttaaa tgcaggacag agatttacaa gataaaagac atcctgcccc tgtcttttac      180
cagggngaac aaaggttaac cactgaagac agttttagac cattatctgc caggagtagn      240
agncagagga atctacctga acatgcttta ccaactcgct tttatctgcc ggttacttgc      300
tttcccgcag agaagtccnt cnnganaccn naaagtcctt tttcttttgt                 350

       <210> 24
       <211> 457
       <212> DNA
       <213> Homo sapiens

       <400> 24
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gcgggcggat cgcgtgaggt caggagttca agaccaacct gctcaacatg gcgaaacccc      120
gtctctacta agaatacaaa aattagccag aaagaaaaaa ttccgagtcc tcaccttggc      180
aagatggagg aaagaaaagc ttttgagggg gaatgagatg ggacctgcca gtgctttctc      240
tcagacagtg ctgggagggc tcttctgaga tcccatctcc cattctctag tcaagatcac      300
tggctcctgc ctgggtcctg gcactggctg gatgaagtct cagaatttgc tcctgccccc      360
aggcagaggc cctcatgcaa atttgagctg tttccagtgc cttcagccag aagtccattt      420
tgcttggngg tggacccttc ttttcttctt ggatggc                               457

       <210> 25
       <211> 267
       <212> DNA
       <213> Homo sapiens

       <400> 25
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gacagagatg ggtttcgcc atgttgccca ggctggtctc aagctcctga actcaagtga       120
tcttcccacc taagccnccc aaagtgctgg gattacaggc atgagccacg actcccagcc      180
tgaaatntan nattntaatc tntcagcttg taantanana aaaanngtnc ggngagncna      240
nttttngttn nntnttaatc ccgcctt                                          267

       <210> 26
       <211> 346
       <212> DNA
       <213> Homo sapiens
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<400> 26
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gagaaaatgc catgtgaaga tggatcagag acagaagtga tgcggctgca agccaaggaa 120
tgtgaagaat ggccagccac caccggangc taggggagac gccagcacag attctccctg 180
agagtatcca gaagaaacca accctccaac acctggattt cagacttctg accttnagaa 240
gtgngagcca attnancatc tgtagtgntt tactcttcct acctnaaann tataaaaata 300
tnttnntctc nccccaccct tttntttcat nttcttttct ttactc 346

<210> 27
<211> 502
<212> DNA
<213> Homo sapiens

<400> 27
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tgacactagg ccgggcgcgg tggctcacgc ctgtaatcct agcactttgg gaggccgaga 120
tgggcggatc acttgaggtc aggagttcaa aaccagcctg gccaacacgg tgaaacccag 180
tctctactaa aaatacaaaa acattagccg gatgtggtgg caggcgcctg taatcccagc 240
tacttgggag gctgaggcag gagaatcgct taaaccttgg aagggggggg ttgcagcgag 300
ccgaggtcac accattgcac tccagtctgg gtgacagagc aaaaccagta gcagaggaaa 360
gagggtgaaa tgcagaaaat gactaatgct tttcatagta agnccgctat ccatttgntt 420
tttnaaacaa nctatctnng cnttnaaagn nttttttttna antaaannna ttttnnnagc 480
ctttccatna aaaaaacagg gc 502

<210> 28
<211> 104
<212> DNA
<213> Homo sapiens

<400> 28
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ngacactagg ccgngcgcgn natgaccttt tgagcaagtt cagc 104

<210> 29
<211> 260
<212> DNA
<213> Homo sapiens

<400> 29
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tcgccagagg gaacagaaag tcctcacttg ataccggcag aaacaggaac agggttaggt 120
agtctccggc aggctggtca gttttgatct ttacaacttg ggttgatgat cacctcagcc 180
ctaccttcaa aagcgattcc tgtccacagg ggttggtaac tgccttcccc tttacacaaa 240
aaacaagaaa aaaaatggtg 260

<210> 30
<211> 425
<212> DNA
<213> Homo sapiens

<400> 30
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tgagaggaca caggctctgg agttcccggg acccaagcac agtggctgca acttcctngc 120
gttggctgtc aaaaaaggaa acttaagcag aaatgcccag ctgtgatttc tcttctccaa 180
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gtgccagagg atcaacaaag aaaaacaact tggcctcaca tgataatgac cccaagtggt 360
tggtcaagaa aaagaagtgg caatgaatga acagattata catttctttg aagaatttga 420
ctgag 425

<210> 31
<211> 533

<212> DNA
<213> Homo sapiens

<400> 31
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cgactatnca ncatgaatga atgacagact gaatgacatg aagcctggag tctcaaggcc 120
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ctgaaggtgc tttggcacct ggagactact ngagccagcc ttgccggggt tctaatctga 240
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ccagcacttt gngaaggcca aaggcaaaac caaatcactt gaggttcang nagtttttaa 420
agaaccagtc ctgccccaac cantggnttg aaaaaccctt ntttttntna ctaaanaaac 480
accaaaaaaa ttaacccncn ttgttanggg ggcaanccc cctttataat tcc 533

<210> 32
<211> 337
<212> DNA
<213> Homo sapiens

<400> 32
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ctgatttttt tggatttgac gtcaaggcaa acatcattgc aaactcaatt ccagcatgcc 180
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ttgtaatccc agcacttcgg gaggccgagg cgggtggatc acctgaggtc aggaatttga 300
gatcagcctg cacaacatgg tgaaaccccg tctctac 337

<210> 33
<211> 274
<212> DNA
<213> Homo sapiens

<400> 33
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gagatgcaca gggagggcgc tgtgtgaaga tgatggcaga ggttgcagag atgctcaaag 120
agccaagaac atcaagggcc gccggcacca ccagaagtca ggaaaaggca aagagggttc 180
cactcagagt cttggagcat ggcctcccga tgccttgatt tcagacttct agcctgcagg 240
atgataagac agtaaattcc tgcagtttta agcc 274

<210> 34
<211> 290
<212> DNA
<213> Homo sapiens

<400> 34
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tccattccca gagtccaggc cttcattaac tcacacgaga actacagaag catcacccct 120
agttctccta ttagtcactc ctcctcaact gcctctaatc catccatcca tctatccggc 180
atgggtcatg taaagttaca gctgagaagg tactccctct cttaaactcg tcggggctcc 240
atgtggcttc aagattgaaa ataaaactac tgcgtatggt atataaactt 290

<210> 35
<211> 384
<212> DNA
<213> Homo sapiens

<400> 35
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ttcatgctga aatcctgggg gaaagaagtg ctaaatcagt tgaggacatg ggaacattta 120
ttctggaaga aatttgggta cagagacaga caagcaccaa gagaagatga tgtgaagaag 180
cacagcgaga acaccatgtg aaaatggagg actggaatga agcatctaca agccaggaaa 240
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aaagagagca tggtcctgct gacatgttga ttttggactt ctggcctcca gagctgtgag 360
aataaatttc agttgtttta agcc 384

<210> 36
<211> 516
<212> DNA
<213> Homo sapiens

<400> 36
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nacgttcccg gcccattggg aacggacttt tntncccaaa aaaaaggtca aggccccatt 420
ccnccaaggc ctttgcaagg aagnttgcaa ntcccaactt tttttgggtg ttggnanggg 480
caaggtttnt tgatgtcanc accttttact ttaagg 516

<210> 37
<211> 481
<212> DNA
<213> Homo sapiens

<400> 37
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agctgaaacg acctaaaagt aatgactctt gtactcccag tagcaatgag cactctcagt 360
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<210> 38
<211> 491
<212> DNA
<213> Homo sapiens

<400> 38
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ctcatctaat gtatttttct ccacaaacag aagtaattta aatgacatct tggcagagta 120
gccaataatc aacaatggcc acttcttcca ctcccaagtt ggctgaattg caatgggacg 180
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tgatggggaa g 491

<210> 39
<211> 323
<212> DNA
<213> Homo sapiens

<400> 39
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tcattgggga tgaaaatgtt aaaagctagc ccaaagcaca ctacgtacat gcaggagttg 240
cctaaaagca catatgatta aaaactccaa agaaaacgca aacnctttg gatttacgat 300

actgtaagat agctcccacc tct 323

<210> 40
<211> 496
<212> DNA
<213> Homo sapiens

<400> 40
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cttaaccctt tgagga 496

<210> 41
<211> 331
<212> DNA
<213> Homo sapiens

<400> 41
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tctacaacgc tcatggcacg agggaggaaa tggggtgcag aggctaagga acgtgcccaa 240
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atgtgtaaaa caacaaagac gtctaactca t 331

<210> 42
<211> 238
<212> DNA
<213> Homo sapiens

<400> 42
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ttgctggaaa gaagtgcaaa atacctaagg aaacctcctt gtggcctcca ttaaccccag 180
ctagcaccta ccaaatcagc aaaatccgaa atatgattta aataaattat gcttaaag 238

<210> 43
<211> 565
<212> DNA
<213> Homo sapiens

<400> 43
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attgaccccg agggangggnt ttntnacttc cgccgccctg ggatgcgggg cttcttttnt 120
tcttccaaca cattcttggc ttcattcatg ggcccggaag aatcttggcn aatggcccaa 180
tgtccccccc agattccccc agaanggggtt cacccagaat ccctaaaacc atgccgaang 240
gaaagcttcc catcaaaaat ttggtcaagg gcnatatcat caaagggaag tattgccacg 300
aagaaccaat cgggggggaa cnggccccggg angccccggg aagtttccc ggggaagaaa 360
cgaagccaaa aaagccgcca ntncctgggg gcctttgctt gggaagaaac cttttctaaa 420
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ggaccaaaaa tttaaaaagc tttag 565

<210> 44
<211> 684
<212> DNA

<213> Homo sapiens

<400> 44
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cttttcattt tggcaccttg gcccttttttg gcttttcttt cggtccaaaa aggaattttc 180
ccttaaaagg ggaaaaaaat ggggggccac ccacccaaga aaattccctt ggggaagnaa 240
aatcctggct tcccaaaagn aaaccttgga ttaaccccaa aagnaaattt tggggattct 300
tggaagnaag gggtaagnaa aggggaaaat gggaaattcc ggtaaagntn ggggaattgc 360
cttgccattt tggtccttac caattcttcc ccttttaagg gaaccttcca aaaaaggaac 420
ctttttaagg ttcctttttcc ccaaggggtn ggccccaagc cttggaattt taacccccttc 480
cccaagncct tggttccaaa ggggcccctt tccccctttgg gggaaaaaac ctttgggggg 540
cctttccaaa ggccttttgg gaaaggaagg naaaaccctt gggggccttt ttaattttnc 600
cccnaaggna aattcnaacc aaccttttnc cccnttttttt nccctttggg gggggggaaaa 660
aggttncctt taaccaattt ttcc 684

<210> 45
<211> 259
<212> DNA
<213> Homo sapiens

<400> 45
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attgggtaca atagcctgga actcctggac tcaagtgatc ctcttgcctc agctttccta 120
gcagctagga ctacaggctt gtgccactgc atccaacgtg gaccccccttt tgtatgccac 180
aatctatcca gtgcctttcg ctaagctttg caatttccct cctatttgta atattaatgg 240
tttatacttt ttgatttat 259

<210> 46
<211> 346
<212> DNA
<213> Homo sapiens

<400> 46
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gatggaatcc cccatctcca ttcccaaaag tttccctacg ggagcctggt gttgtctcct 120
ccggaactgt cctcgcggct gcctgttttt ccctagccat ggttactgcc tgcgggggat 180
tcagcctgtg aaggcagtca aggcagttca ccactgtcat caaacctaca cccctgtgtg 240
catgcgcaca cacacttgta acccagtggc acaatgcagg aattagggaa gcaaaggcaa 300
atcgctgaat agctagggca cctgatccct gtaagggccc atcaag 346

<210> 47
<211> 203
<212> DNA
<213> Homo sapiens

<400> 47
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cctatgcttt agagtgagaa gaaataccag aatctggaac caggaagtga gtcctctagg 120
gatgaggagg tattcagctg gatggctttt taaaacattt cctccagagt cttctgcctg 180
attaaaaaca gttttcgtcc tag 203

<210> 48
<211> 213
<212> DNA
<213> Homo sapiens

<400> 48
ctgagatcaa tgaaacaacg aacaaacgag gagaatcacg gaatgtcagc angtatgtct 60
cctttattcc cctatgcttt agagtgagaa gaaataccag aatctggaac caggaagtga 120
gtcctctagg gatgaggagg tattcagctg gatggctttt taaaacattt cctccagagt 180
cttctgcctg attaaaaaca gttttcgtcc tag 213

<210> 49
<211> 341
<212> DNA
<213> Homo sapiens

<400> 49
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cggcttctac cgaggacccc tggatcaacc cgctggtccc tcaattaccc tagaaaattc 120
ccctctggag gacaccaaac tgcagggccc cttcttcacc cctaaccagc aggaagtagc 180
cagaacgact gccacacggt tcccaacagc agttggggtg tcctgtttag aggcaggact 240
gagaggaggt gccagctggg cttcctgggt caaggaaggg ggtnaaaaaa gctgngaaac 300
tcactcattt cctgcatcag gacttacttc agtcctgttt t 341

<210> 50
<211> 337
<212> DNA
<213> Homo sapiens

<400> 50
acaaagaagt ctctgcccag ggtcgttgct tttaaagata ttctgatgca aaatgccagt 60
actctgctcc tccattctac agatcaacaa atctttctac agccaggtgc agggggctct 120
tgcctgtaat cctagcactt tgggaggcca aggcaggcag atcacttgag gtcaggagtt 180
tgagaccaac ctggccaaca tgatgaaacc ccatctctac taaacataca aaaacattag 240
ctaaacatgg tgtcgcacgc ctgtcgtccc ancttctnng gangnttgag gcaggaaaat 300
cncttgaacc tgggaggtgg aggctgcagt gagctcc 337

<210> 51
<211> 308
<212> DNA
<213> Homo sapiens

<400> 51
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attctataga tctgcgatgc ccgggcagtg atgtcatcat gattgagagc agctaactat 120
ggtcggacgg atgacaagat ttgtgatgct gacccatttc agatggagaa tacagactgc 180
tacctccccg atgccttcaa aattatgact caaagggaca tctctgaagg tctctgccaa 240
ctccagagct cccgccctga ggaatttgct gggcttttgt tgcgantgnc tngaagttcg 300
ccctttaa 308

<210> 52
<211> 331
<212> DNA
<213> Homo sapiens

<400> 52
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ttctcctgcc tcagcctcca gaatagctag gattacaggc gcatgccacc acgcccggct 120
aatttttgta ttttcagtag agaaggggtt tagccatgtt agttagccag gctgatctcc 180
aactccgacc tcaagtgatc cgcccgcctc ggcctcccaa aatgctggga ttacaggcat 240
gagccaccgc gcccagcccc aggcaacata ttttcttaag gnanctttta anaaggccat 300
gcatttccac atttccacac ctttcattac t 331

<210> 53
<211> 322
<212> DNA
<213> Homo sapiens

<400> 53
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tctcagtgcc tcaaccagca gctacaagtc agagtcaagc ccattatgac cccttcttcc 120
tgcctgagct ttggccccag atattctgag aggggttgga tcctccaggg catcgacctc 180
acagctctgt cttctgtcct gagctcttct cctggcatgt aaattcagga ctcagataag 240

ccctgccctt catagccacc ttggatgctg cgtgactacc tgngaatcan ggaggactgg 300
aaaagacatt agggagggta cc 322

<210> 54
<211> 330
<212> DNA
<213> Homo sapiens

<400> 54
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agacgctgca ttcctagatt gaaggcctgg ctcctggtgg acagccttct ctctaaagct 120
actctctcca ggttctggca actgcagcca aagggccaaa gtgtatgact caggagtgtt 180
acttgaattc ctggaaccag ctatgcctga agtcaatcca ttccagttgc actttcttca 240
ttctaaatct ccctgttctt tcaaggatgc ctgggttgcg aacngggntt ccngganggg 300
taatgacaaa gnggcttatt ccccataaat 330

<210> 55
<211> 325
<212> DNA
<213> Homo sapiens

<400> 55
angcaaaaca tcgcatcttt ccattttata ggacaatgcc aactcctgaa gatcttgctc 60
taagtggtca aagggtgagc atactgcagg caacaaaaga tcgagcatac tacaggcaac 120
caagggtcaa gacaaattta caggatccct ccctaccgtg gccactaccc agcttcccag 180
tagtgccttc ctaatttgct gcccatggta atggagacaa atacctgcag aagaacataa 240
tcaaaactca aaggaaagta aggaggagca agttttttta aaagggattc cagttggcaa 300
tcctcttgtt actaattctt gttga 325

<210> 56
<211> 330
<212> DNA
<213> Homo sapiens

<400> 56
aatccccaaa ctcaatgagg acacgttttc ctcccgagaa cagcagaatg gtaacaaaga 60
acacatgaaa agaaaatgct ttcaaggacc aaaggaattc atctacaaat atggaatttc 120
cagcatggaa gtcagtgaca aagccctggc ataccccccat cgcaggtgtc gtgagaacac 180
cgtccagtgg gacgaggcca gccctgccct gagaagctga gattcccacc ctacctggag 240
ggagctgagc accctcacag caactctgag cccctgactt caaanggaaa ctttttttcct 300
gtggtatcag acgtagaggg cgggctcttt 330

<210> 57
<211> 199
<212> DNA
<213> Homo sapiens

<400> 57
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tagcctccct gagtaactgg gaccacaggc atgaaccacc atgcccagct acctttaaaa 120
aaatagagag agagacaggg tctcactatg ttgttcaggc tggtctctaa taaattgtta 180
ttaccaatga aaaaaaaaa 199

<210> 58
<211> 419
<212> DNA
<213> Homo sapiens

<400> 58
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tttcatcatc ttctgctaag aggcgcccct ccaccaccct gcatgagtaa gacacagcct 120
ccctgcagca cagaggaggc ttntgtgagt gcccanggca tcaccaaggt cagggagaac 180

ctcttgaggt aactngcatt tgtgtcacga agccgaanag ggttgcaggg gattgcgtga 240
tccccatcct gntcatgggc caccacccca ntccactcan aagataaggc ctcctngatc 300
anatncaatg actcattgca tgttatcccc gcacttttan aagcttangt nggcccgatt 360
ggctgaaccn cattantttt taagaccatn cctggccaan aatggnggaa ccccattttt 419

<210> 59
<211> 280
<212> DNA
<213> Homo sapiens

<400> 59
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ctgcctccca aagcgttgag attacaagcg tgagccacca ttcctggacc ctcgtagttt 120
ttctggagcc tcgtgatntg atatgatctt cctgccgctg attcctcaca gtattggctt 180
gccacacctc caggggcact gatcacattc tacctggcat tatttcatct gagtncctgn 240
cctanccctt ctgcccatta gactgtaacc ttgtttaggc 280

<210> 60
<211> 359
<212> DNA
<213> Homo sapiens

<400> 60
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aggtgctatg gaaatagcac atgctaaagg agtcttctaa gcagcccana ggcgatgaca 120
taccagtgcc agcagaggag gagaaccacg cttcagtata acaaaaactt cnatgaatca 180
tgcncaatgt ggaaaagtcg aatagacatg gctgaggata aaagaaaaga acgtacacat 240
aatctcacta cccagagaga agcaatgttg acatatttct cttcctcaat gcatatttat 300
atattgttga tatttttact gtctgtgcaa ttttgcttta attaaacatt tagattatg 359

<210> 61
<211> 70
<212> DNA
<213> Homo sapiens

<400> 61
nantcattat gnntnctgtt tncctggatg gactccgact ganagatana cgccattgac 60
gcatactcgg 70

<210> 62
<211> 178
<212> DNA
<213> Homo sapiens

<400> 62
cttgattaca gcagcntgat gctttgcctg gataaacaaa ngctctnngc naggaagaga 60
ctttnggacc agcaagagac tagantngaa acagagttta aacaagcatc ataacccctg 120
aagcnaattt tatcatgatt tcaatttgca tattaagaaa ctaagatttg gaaaaaa 178

<210> 63
<211> 167
<212> DNA
<213> Homo sapiens

<400> 63
gtgaagaatg aaggaacatt ccaggatcaa gtttcctaaa atttggaaat aaactgtgga 60
aattctccta agtttagggg gagacagaac cacctagaat cactgacacc ttgattcaac 120
acaatccgca gaccgggtga ttaaataaag cactttggtt ttttcat 167

<210> 64
<211> 435
<212> DNA

<213> Homo sapiens

<400> 64
gggcattcaa gataagccat catatcccct gtggcctgca cgtacacatc cagatggccg 60
gttcctgcct taactgatga catttcacca caaaagaagt gaaaatggcc tgttcctgcc 120
ttaactgatg acatggtctt gtgaaattcc ttctcctggc tcatcctggc tcaaaagctc 180
ccctactgag caccctgtga cccccactct gcccgccaga gaacaacccc cctttgactg 240
taattttcct ttacctaccc gaatcctata aaacggcccc acccctatct ccctttgctg 300
actctctttt cggactcagc ccacctgcat ccaggtgaaa taaacagctt tattgctcac 360
acaaaaaaaa aggnnggggg ggncnnnncc natttgggt tnaaacnnnn gnanttnttt 420
ttaaaagggg ggggg 435

<210> 65
<211> 355
<212> DNA
<213> Homo sapiens

<400> 65
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aacctccgtc tcccgagttc aagcgattct cctgcttcag cctcctgagc agctgggact 120
acaggcatgc accaccatgc ccagcttatt tttgtatttt tagtagagat ggggtttcac 180
catattggcc aggctggtct cgaatcctga cctcgtgatc cacctgcctc ggcctcccaa 240
aatgctggga tcacacgcgt tagccaccgc acccagcctt atttacctat taaagagcat 300
attgattgct tccaagtctt aacaattatg aataaagctg gtatggactt tcaca 355

<210> 66
<211> 340
<212> DNA
<213> Homo sapiens

<400> 66
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cctgcttgga acacccccta ctgaaaacca gctgccaaac aaaagggcca ccatgctgtg 120
aggaaatcca agccagccag tgaagngaat agtcacatga aggacgacca aggcacagtc 180
atatgagtga agccttcttg aacattccag cctagctgtg gatgaatgca gcaaagtgag 240
tgatccagtc aacgccataa gcaacagaag aacagcccag ccaagccctg cctgaattcc 300
tgagccatga ttcataagca aattaaacag ttattgtttc 340

<210> 67
<211> 439
<212> DNA
<213> Homo sapiens

<400> 67
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cccaccttaa ctgatgacat tccaccacaa aagaagtgta aatggccagt ccttgcctta 120
actgatgacg ttaccttgtg aaagtccttt tcctggctca tcctggctca aaaagcaccc 180
ccactgagca ccttgtggcc cctactccta cccgccagag aacaaacccc ctttgactgt 240
aattttcctt tacctaccca aatcctataa aacggcccca cccttatctc ccttcgctga 300
ctctcttttc ggactcagcc cgcctgcacc caggtgaaat aaacagccct tgttggttac 360
acaaaaaaaa aagggccggn ggggccantt aanntgggan taaacnaggn ngannttgnt 420
naaangggggg ggacccccca 439

<210> 68
<211> 347
<212> DNA
<213> Homo sapiens

<400> 68
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tcccaggttc aagagatcat cccacctcag cctccctagt agctggaact ataggtgcac 120
gccagtatgc ctggctactt tttgttttta tagagacaca atctcactat gttgcccagg 180

ctggtctcat attcctgggc tcaagccatc cacctgcttt ggcctcccag agtgctggga 240
ttacaggtgt gagccaccat gcccagcctc gaatttcctc tacttggcct gaagcagaaa 300
gccacagaca acagagacct aagctnctaa tgaataaaga accccccc 347

<210> 69
<211> 328
<212> DNA
<213> Homo sapiens

<400> 69
gccctgcact cgatggatca gctggcacca cccagatcaa taaactggct catctggtct 60
tgtggcctcc atccaagtac caactcagtg caagaagaca gcttcgaccc cgtatgattt 120
aatctccaac ctgaccaatc agcactccct actccctggc cccctaccca ccaaataatc 180
ctcaaaaaaa cccagtctcc aaattttcag gaagactgat ttgagtaata ataaaactct 240
ggtctcccgt tcaaaaaaaa aanggccagn gnggccantt nanttngnan ttanccnggn 300
tgaanttgnt naaanggggg ggcttacc 328

<210> 70
<211> 386
<212> DNA
<213> Homo sapiens

<400> 70
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tgcttgagcc caggagttca agaccagcct gggcaataca gcaagacccc atctctacca 120
aaaaaaaatt taattagctg ggcatggtgc tgtgtgtata tagtttcacc tactcaggag 180
gctgagatgg gaggatagcc tgagtccaag aagttgaagc tgcagtgagc tgtgatcgca 240
ccactgcact ccagccttgg caactgggga aagaccctaa ctcaaataaa atttaaatat 300
atatatacac acacacacat atacacacac acacacacac acacacacat atacacatgt 360
atnttttgta ataaatggat aaacac 386

<210> 71
<211> 459
<212> DNA
<213> Homo sapiens

<400> 71
aaactgcacc tcactggctg ggaatgagga tatcttatgg aagattctta tttttggaac 60
tttttgaact ctctctgttg gcttctgaaa gctgaatgct ctttcaaagg acctgaagat 120
ttcttttgtc ctcagttaca ttgagcccac atttatgagg cactggtaaa acatttctgc 180
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gcatgcattt tgcaaatgca cagctcagtg agtgtgtctt cccgttgttt gtggtttaca 300
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caaagagttg ggtggcaagg gggtagggaa ggcaacccta aatgctttga atgaattatt 420
gaattgacat ggtccaaagt gacatttctt tttaaaatg 459

<210> 72
<211> 528
<212> DNA
<213> Homo sapiens

<400> 72
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ctgggcatgt gtttccttga gtatattatg attggaattt tcccaccttc ttgcattttg 120
aatatatgcc agcatttctc caagatgtat atcctagagc aaaatttctg ggccatagac 180
agagtcttgc tctgtcgccc aggctggagt gatgaggccc gatcatcact ccacctgggc 240
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gggattacag agcccctgtc atccagactg gagtgcagtg gtacaatccc ggctcactgc 360
aacctccacc tcctgggttc aagcgattct cctgtctcag cctctcaagt acctggaatt 420
acaggcatgt gccaccgcac cccatgtaat gtcccgatct tgatggatgc actctggtta 480
tagaaatgtc ctcattttaa ggaaatacat gccaaagtaa gtaaaggc 528

<210> 73
<211> 296
<212> DNA
<213> Homo sapiens

<400> 73
gttcaactca ttgccacttc ctgtagctgt cttagtgacc cttcaggcca gaagcagatg 60
cctgtgctgt gtaccatgcc cctcctgctg ctgaactgga gagaaaacgt ggctggcagc 120
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ttaaacatcc tcaagtcagc agcacagctc cttctggaag gcactttaac tggatgggat 240
cctctcactg tagacattgc tacctccctt tcctgaaata aagcctgctc cagagc 296

<210> 74
<211> 410
<212> DNA
<213> Homo sapiens

<400> 74
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caaccccctc catgtcatcg caaaggctga ggagatcagt atttcaccac acctttgtgc 120
ttcacttagg tatcgcaagg aaggaaaact gtctccatct gaagaggaca tagccatgta 180
tctgctttgt tctcttcttg atttccacgt tccccaaaat gggcagggct ggcttaaaaa 240
gcaatggaga aaaagttctg gagatggatg atggtgatgt tctcacaaca atataaatgt 300
acctaatgct acagaactgt acacttaaaa atgcttaaaa tggcaaattt tacnttatgt 360
atttttgact ctctgtctcc cccaaaaagc aatgaaggct cttccttttc 410

<210> 75
<211> 357
<212> DNA
<213> Homo sapiens

<400> 75
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gttcctgcct taactgatga catttcacca caaaagaagt gaaaatggcc tgttcctgcc 120
ttaactgatg acatggnctt gngaaattcc ttctcctggc tcatcctggc tcaaaagctc 180
cctactgagc accctgtgac cccactctgc cgccagaaaa caaccccccct ttgactgnaa 240
ttttctttac tacccgaatc ctataaaacg gcccccccta tttcctttgn tgactctttt 300
tttggactta agcccactgn attcaaggng aaataaacaa gctttatttg ttacacc 357

<210> 76
<211> 219
<212> DNA
<213> Homo sapiens

<400> 76
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cctgaggagg agctgcctta ttgttaaggg gtagcaagaa gcccaggcgt ggcagtccac 120
gcctgtaagc ctagcacttt gggaggccaa gatgggagga tcgcttgagc tcaggagctt 180
gagaccaccc cgggtaacat agcgagacct cgtctctac 219

<210> 77
<211> 401
<212> DNA
<213> Homo sapiens

<400> 77
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aggcactacc attggaagat gtgctgggga gaagcccagc ccagcaacat gcggcaggac 120
cacatctcgg cagagctgaa gacagagacg ttgcagcgac aaggacaact ggcatgcctc 180
acattcctca gtgttgaaaa caataaaagg agggggaatg agagaaaaat caaatttcta 240
cgaagagatg tcagcagtaa atttaatgca ggtgcaatat tctccaaaca aaggacgttt 300
tgtttctacc gtctgggctc tgtgaaaacc tgctccacct cctccttgct atgtgttttc 360

cttttatct gtgtaaggta gattaaaatg ttgataccct t 401

<210> 78
<211> 387
<212> DNA
<213> Homo sapiens

<400> 78
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catcctcacc agagtgagtt tcatcactaa gacaaagcaa aacagccgga agcagtgact 120
catgcctgta atctccacac tttgggaggc cagcgagggc ggatcacttg agctcaggag 180
tttgagacca tcctgggcat cagacctcat gtctacaacg gaaaaaagac atttagccaa 240
gcgtgttggt gtgtacctgc agttctagct ccttgggggg ctgaggtgtt agaatggctt 300
cagcccggga ggttgaggct gcagtgagct gagccgtgat cgtcccgctg cactccagcc 360
tggatgtcag agtgagaccc ttgtctc 387

<210> 79
<211> 331
<212> DNA
<213> Homo sapiens

<400> 79
aataaaggca actgctgggt gtgataagct cgtgcctgta gtttgggagg ccaaagcaag 60
cagatcactt gagccccgga gttggagacc agcctggata acatcgcaaa atcttgtctc 120
tacaaaacag acaaaaatga ggatcgcttg agcccgggag gttgaggctg cagtgagcca 180
cgtttgagcc actacactcc agcctgnata actgagcaag accctgtctc aaaacaaaac 240
aaaacaaaat aaacaaaaaa ggccagcgag gncnattcag nttggactta accaggctna 300
acttgctcaa aaggnggga ctacccagga a 331

<210> 80
<211> 151
<212> DNA
<213> Homo sapiens

<400> 80
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taagtcttct attaaaatga aaatgcttca g 151

<210> 81
<211> 305
<212> DNA
<213> Homo sapiens

<400> 81
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gacaaacaaa atgcctcttc cagctttgtt acaggaaaaa tcacagatca ataagaaaag 120
ctgatgagaa aacaaagcaa ccagaaaaag gtggcaaacc cacactgtgt atattgagaa 180
atagaactgt cttcaattag aacaacagat ttgccataat ccataaaatt catgttatga 240
gagtttgaag cagttatgta caatgtttta tactacaaag tagataaaga ccctccatcc 300
cacct 305

<210> 82
<211> 329
<212> DNA
<213> Homo sapiens

<400> 82
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agatcacttg agccccggag ttggagacca gcctggataa catcgcaaaa tcttgtctct 120
acaaaacaga caaaaatgag gatcgcttga gcccaggagg ttgaggctgc agtgagccac 180
gtttgagcca ctacactcca gcctggataa ctgagcaaga ccctgtctca aaacaaaaca 240

aaacaaaata aacaaacaaa aaaaaaangg ccagngaggc caattnagnt nggacttaac 300
caggntnaan tngntnaaaa gggggggac 329

<210> 83
<211> 443
<212> DNA
<213> Homo sapiens

<400> 83
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cacacatttg cataacagca atgagagaaa aagtagattc ccgaggagaa gcactggaaa 120
ttaacataca acataaatgt gtcataagaa aaagttgaaa attgtggctt ctaatgagtt 180
atctgaaaaa cacttaacat gagatacatc tctcttaata aattgttaag tgcactggac 240
aatattgtca attataggca caaggctgta cagcagatgt ctagaactta ttcatttcat 300
gtaactgaaa ctttatactc attagatagc aacttcccat ttccacctct tcatggcccc 360
tgggaatcac ctttctttct actctctgct gctatacatt tggctacttt agagatctca 420
tacnaataaa tagaatcatg tgg 443

<210> 84
<211> 352
<212> DNA
<213> Homo sapiens

<400> 84
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acaagaggac agtcaggcca gccacagtgg ttcatgccta taatcccagc actttgggag 120
gccgaggcag gtgaatcact tgaggtcagg agttcgagac cagcctggcc aacatgagga 180
aaccctgtct ctactaaaaa tacaaaaatc agccgggtgt gatggttgca cctgtaatcc 240
cagctactcg ggaggctgag gcaggagaat cgcttaaacc caggaggtgg agattgcagt 300
gagccaagat catgccactg cactccagcc tggtgacaga cgagactccg cc 352

<210> 85
<211> 268
<212> DNA
<213> Homo sapiens

<400> 85
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cctgatgtac aacagttaaa gtgcagagaa accctctgcc aaactttggt gtgctttaaa 120
agttatggca gtcaggctcc ctttactgtc ataactggaa cacctttcac ttttcaaaag 180
agctggtgta tctgcttgct gtacaactac aaatatatac ttttgattaa gaaagttgag 240
aaaaaataaa agcagtttaa tttagccc 268

<210> 86
<211> 179
<212> DNA
<213> Homo sapiens

<400> 86
gtaacccttc agaatgttga agactgttgt acaaagtaat taatgagctg ccctggatct 60
gaggcaagcg acggaagagt caagatgact aaaagtcttc tgataaaggg tttctttaag 120
gaaaagaaaa tcccacaatg caaccagcaa tgttaatctt caataaatac gctgttaat 179

<210> 87
<211> 362
<212> DNA
<213> Homo sapiens

<400> 87
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agagctctcc ctctgtccat gggcacacag agaattggcc atgtgaggac acagtgagaa 120
gacagccatc tgcaaaccag gaagagagtc ctcaccagaa cccagccctg ccggcacctt 180

gatcttggac ttccagactc tggaactgta ctaaccagaa gttcaagcta ggggttggag 240
aaggaaggtc atacatacag aagcaagaac ctcaacccct agaactgcta tgaaaatcaa 300
acaaaatgct atttgtaagt agtcttcctg tgctggacta aattaaaaga actttgcagc 360
tc 362

<210> 88
<211> 431
<212> DNA
<213> Homo sapiens

<400> 88
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cccacaagac tgccagcgaa attttgcaga ctcaagatgt tcggagagtt tggacaatca 120
tcacagtttt tggacgccta tctgagacca tcttctgtga agtttattca gctcataagt 180
gtgaataaaa aattgctaaa tgtgaactca aagagacagt gcagttttac atctgagtcc 240
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ggaaacaagg atcacggagc atgtgagaaa atggtaattg agaaggctga tcaaggaaca 360
cactaaaatt ggaggcatga aacacttggc gaaatggtcc catnggtcca tctggggatc 420
ctgggaacaa g 431

<210> 89
<211> 216
<212> DNA
<213> Homo sapiens

<400> 89
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ccacgatgga nagcaaaggc cagtttcaca gacccaaata catttggcct ctgaacgaca 120
tggatttgaa ctgngaggat ccatttacat gtggattttc ttctgcctct gccgtcccag 180
agacagcatg accagccact catcctcctc ctcctc 216

<210> 90
<211> 260
<212> DNA
<213> Homo sapiens

<400> 90
tttgcaaatg atttccaaat ataatttctc atcggaatct cacaaccacc aaatacgacc 60
aggcattatt catctgattt tatagatgag gaaatcaagg gtcagagaag tgatgtgact 120
tgcccaaggc ccacagatgg taggtggcaa agccaggact tggaatccaa gataaagaaa 180
actcagtggg aaggagaagt ttgtgattaa atccaattaa aggaatagag taaaataaag 240
aacacagtaa atttctcacc 260

<210> 91
<211> 265
<212> DNA
<213> Homo sapiens

<400> 91
atgatgaaaa tgatcctcag aggagcattg ttaataatca aattaccaaa gaatgatgcc 60
tactctgaat ccagatgtct gacttcacag gacaaaacca ctgcatttac tgttctcaaa 120
tgatttattt taagaattta cgcttctaaa tttaatccct gagggtaatg ggttatgtct 180
taaaatatgt aatggaacat taaaaaaatg aattctttct tgcttggttt cggccaaaat 240
gtaaataaac tgaatatcaa atact 265

<210> 92
<211> 326
<212> DNA
<213> Homo sapiens

<400> 92
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tggctttgca aagaagtgaa atctacaatg caaatatcca gatctccaaa ccctggtcaa 180
atggcagtga ctgaagctca tgccccacct cccagctgtg caaccttggg gcaagtcact 240
tcacctctct gggcttcaac ttcctccttg gaaagacaga atgccaacat ccatcctgcc 300
tcttgccaag atgttttata gactgc 326

<210> 93
<211> 367
<212> DNA
<213> Homo sapiens

<400> 93
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accttggcct cccaaagtgc tggaattaca gaagggagcc accatgcctg gcctggagta 120
tataagtgct taagaacctt gttcaaataa gaaggaacca gaaaaccctt cgttatagca 180
attgctctct cttgaaattg ctccagatcc ataacatctc tcttcatgtt cgggatgtgg 240
atttcatgaa gatattttga aggtgctgct gagacaatgg ggcttttcta tataaacaaa 300
gtttttatta gctttttgc ttatctggat tttactgcta attaattaaa gcccaatact 360
ttttcag 367

<210> 94
<211> 371
<212> DNA
<213> Homo sapiens

<400> 94
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ccacaaactc agcagcttca aacaaccaaa atggattctc tcacagctct ggaggccaga 120
aggccaacac tcaaggtgta ctgggaccgt gctccctctg aagcccccag ggaagaatga 180
cttccttgcc cctgccagct cctggtggtg gccggcggtc ctgctcgctc cttggcttgt 240
agacacatct ctcccatctc tgcctccacc accgcgtggc cttctctgtg tgtctgtgtc 300
cagatttccc tcatataagg gcatcagtca ttggactggg gccatcctca tacaacatgc 360
tgttagcctt g 371

<210> 95
<211> 415
<212> DNA
<213> Homo sapiens

<400> 95
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attgtctacg atcccaaagg aaacaataat gcgagtacaa caaattcttc ttgcaagaga 120
aaatcctgca aaactactta acagaataac actggtcaat gctctaatca tacatttgtt 180
aaaccttata taatgttttc aaatatgcat gcaatccagg tgcagcttta actaaaaatt 240
cagtctaatt ttattttcag tttaggttct tggagcaaac atctttgcat aaatatttgc 300
ctcactacta gcctctctcc atataagaaa ccatcatttc tcttaaaaaa aaaccacaag 360
ttgttttatt tccacaatag gnatctaaaa gatcattttt aaaaaaaggc agctt 415

<210> 96
<211> 407
<212> DNA
<213> Homo sapiens

<400> 96
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gatatgtcag caatgctggt ggtgccagag gtttctgaag ggtctcactg tggtgcctat 120
gctggagtgc agtggcacaa tctcggctca ctgcaacctc tgctttccgg acttaaacga 180
ccctcgatcc tcccacctca gcctcccgag tagctgggac cacaggtgca taccacgaag 240
cccggctaat ttttttgtgt ttgtggtaaa gacgggcgtt tcaccatgtt actgaggctg 300
gtctcaaact cctgagctca agtgatttac acgcctcagc ctcccaatgt atattttctt 360
tgcttccaaa atgattgttg agagtaaagc ttttgatgta cacatat 407

<210> 97
<211> 306
<212> DNA
<213> Homo sapiens

<400> 97
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agtggntgag gaattgtcaa ttgcttcact aagtaccatt aatacggcaa gatagcagta      60
atcagttcca cagaagtcat atcattctca ccctgggatt gntaagatct agacatggtc     120
ttgctgtatt gccctcaaac tcctggcctc aagtgatcct cctgcctcgg cttcccaaat     180
tacaggctgg acttcatgtg gtatagcatt tcttaaaagt ctcaaagaag tcaactctgt     240
aatataaagt cctcatatga atngattcta agttgtagnc agccactaat aaacacacat     300
gcttac                                                                306
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<210> 98
<211> 209
<212> DNA
<213> Homo sapiens

<400> 98
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ctgntgcgct cagccttgaa caccctcccg accttggggc tctgctgccc cacgcggagc      60
ccccatttca acngatgcag acaccccaaa gccccttccc aacagcccga agagaagccc     120
tcctctgaag agacagcaga gaagcagagc cccctgggac gccccccaag acctccacgt     180
ctccccagca cccggcgggg gggtggtgc                                       209
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<210> 99
<211> 229
<212> DNA
<213> Homo sapiens

<400> 99
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aaggctaaag ctctataacc attgaaagct ggctgggga aaagaagaag aggcaaaaag      60
atcaactgaa gaataaactg ctgtcattgg cacaaaagaa taccacaaag attatttaca     120
aaactcgaat caggagtaga acagacctcc atgtggaagt tcaattatgc taagaggaaa     180
gaggaaaggg gaagagttta cagaaataaa ttaatgatga tgataaact                229
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<210> 100
<211> 308
<212> DNA
<213> Homo sapiens

<400> 100
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agcaatgatg ttgttaggat taaatgacaa ccagccttct gttatttctg gaagattttg     120
gaacttccag agaaggcagg agtgagctgt cggggaagga acgacgtctc cttcaggaat     180
tgttgccagc acttgggtca tgaagccctt ctctgtgtct cctccgactg gaatactcat     240
cacgtcctct tagctgataa caatagctga ctttaataag tgtagngctt cctatatatg     300
tgtatgtg                                                              308
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<210> 101
<211> 339
<212> DNA
<213> Homo sapiens

<400> 101
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ttcatgaaat gggaagattt tgctggatta tctggttggg ctctaaatgt attcaaagtg      60
ttcttagaag aaagaggcan agaaagagct gacacacaga agagacggtg atgtgaagac     120
agtggagaga gagagatctg aaatgctgcc cttgaagact ggagtgaagt ggccacaagc     180
caaggaatgc ctgcagcctc cagaagctgg aaaagacaag caatggattc tccaccagat     240
cctccagagg gagtgcagcg ctgccaacac tttgaactca gcccagttat aattattttg     300
gacttctcca gaactataaa agaataaata tttgaaacc                            339
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<210> 102

<211> 75
<212> DNA
<213> Homo sapiens

<400> 102
aaagaacgtt ttctggagaa agatacgagg tgccacatca gagatactta ttaagaccaa 60
taaaccaaaa tacgg 75

<210> 103
<211> 489
<212> DNA
<213> Homo sapiens

<400> 103
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ccagggagca cccccgatca cagacactgt ggccccgcaa tggatgggcg cttccattgc 120
tggagctcac ttttcctgct ctaactgcag gagctgggaa tttgaactgt ttctctcact 180
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aaatcccgcg ggattgcttg agtcctggca cgtgtgaaat gcctgccaag aactgcagag 300
gacagagaca cagtgctcca aaagggttga atggcaactt tatcatggac attttggtga 360
ttacaatatc tacatttcct ggggggtctc agaatcacag aaattatttc aagttagtcc 420
gaggctgctc aacgctgagg tcaaaacatc tgagagaaaa ggttaagtaa aaaatctggt 480
tgtttctat 489

<210> 104
<211> 390
<212> DNA
<213> Homo sapiens

<400> 104
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cccctgngac ctgcacgtac acatncagat ggccggaagc anctgaagat ccacaaaaga 120
agcgaaanta gccttaactg atgacattcc accntggtna ntcgntcctg ccccactcta 180
actgagntga tatattctcc cctncacccc acttaagaag gtactttgca atattcttcc 240
cactcttgag aatgnaaatt tgtacaccta tccccaaacc tataaggaac taatgataat 300
cccccccacc ctttggctgg actctctttt tcaanactca ggcccacccct tgcnncccn 360
aggtggaaat aaacagccct tgttgcttca 390

<210> 105
<211> 361
<212> DNA
<213> Homo sapiens

<400> 105
ttgacgggca gtaaatattc aagacaatga tganggcatc atccantgtg atattncngn 60
tgnnngncnt aactgaanan attgcaccac aannnaagtg natatggnct gttcctgcct 120
taactgatga catgggcttg tgaaattnct tctccaggct natnctggnt caaaagctcc 180
cctactgagc accctgtgac ccccactctg cccgccanan aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatt caggtgaaat aaacagcttt attgctcaca 360
c 361

<210> 106
<211> 433
<212> DNA
<213> Homo sapiens

<400> 106
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ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct 120
taactgatga catggtcttg tgaaattcct tctccaggct catcctggct caaaagctcc 180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt 240

aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcaca 360
caaaaaaaaa aaggncnggg nggccaattc agntnggact taaccaggnt gaacttgnnn 420
aaaagggggg gac 433

<210> 107
<211> 387
<212> DNA
<213> Homo sapiens

<400> 107
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tctggttttc ccatggccca tatggaaggg aaccagggtt gggctaccac catttttttgc 180
tcccagattg gaggatgggt gaggcctctc catcccagct tccctggata acttagttta 240
agcttatgac acatattctc tgaaaggcaa acccatgagg tgtattcaca aagaggacat 300
caaatcccac ttggagtctt gtgtcattaa accattacag tcagccctcc atatccctaa 360
gntctgcatc catggattca accaccc 387

<210> 108
<211> 327
<212> DNA
<213> Homo sapiens

<400> 108
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aaagtccatc ttccactttc tctttggaaa aagaatgcgt aacagtctca ctactgccca 120
tcacctattc cctttcactg acatctcccc aagcccaact atcattttct gcctttaaaa 180
aataactgga atttatataa atcaatccaa cgcctatcat agaccttggt tcacagtatg 240
cattaaaata tgtattggtt gatcattcct tctgcagtgt caagcactgt gccaggcaac 300
agtgattaaa aataatgaat gaaaccc 327

<210> 109
<211> 287
<212> DNA
<213> Homo sapiens

<400> 109
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catgggacaa ggagctgnga ccagtggcca gcaagaaact gaagccctta gtttaacagt 120
ctacaaggac ctgaacactg ccaacaacca catgagcttg gaaacagatt cttcctcagt 180
caaggtttna gatgagaact tcatccanag tagcactagg attgtgctgt acctggtctc 240
ctgacagaga atctctgaaa taataaatgt gtattgtttt aagccag 287

<210> 110
<211> 129
<212> DNA
<213> Homo sapiens

<400> 110
actgtatccc agccactatt tttccctcaa cgtcactaaa tgcaagggaa taatgaaacc 60
acaggagaga aaaaagcagc tgtctgaata aaagaagaaa gaggtagatg cacagaaaca 120
gacggacat 129

<210> 111
<211> 462
<212> DNA
<213> Homo sapiens

<400> 111
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agaacacctt gaagaaagag ctgattccaa ctctgaagtg ggaaatgtat aggatgggcg 120

tggtagaaga tcagaaagct atcaaaaaca attgaggaca tgttcaaaga actcaggtga 180
caaaagagga tcccactggc caaaaatggg acaatgaagt cttatccatc ctcctcttta 240
ctgtggtccc cagaactgtg tcttgaacat ggcaaaaact tgttcagctg tcatgagaag 300
ttgagtgatg agaccttgag cgggaatcat caatgaaagg gccaaggaga tgagatggag 360
cattgtaatc aacaaaagtg cttaacccaa gaaggggtgn cccttattta attacctttg 420
anaatgcttg tnttttaacg ttacaaggta tggcaagaca at 462

<210> 112
<211> 257
<212> DNA
<213> Homo sapiens

<400> 112
acatgccatg tgctgggcat aggaagtgct gtttcagcca ccccaaggag caaccatgag 60
tccagcgtgc ctgctcgtca cacctcctcc tacccctgag cgccacttct gagttgctca 120
tcagcatccc cagctcccag atggctgcct ttgtcccctg ctttcacagc atggatgtga 180
aaggagcagt agattaagaa agacccaaga taacccgtga aagatattca ctgtggattg 240
acaataaaag ccattag 257

<210> 113
<211> 91
<212> DNA
<213> Homo sapiens

<400> 113
agacaatctt actatgttgc ctaagctgat cttgaaatcc ggaactcaag taattctccc 60
cctcccagag tgctaagatt acagttaaaa g 91

<210> 114
<211> 205
<212> DNA
<213> Homo sapiens

<400> 114
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agggcnnnca acagcagcta ggagaggcaa aaatangaac cctgattctt ccctgcancc 120
cctggcagga gtgnggttct actggggttt ggacttctaa cctccaaaat tgnnaaagaa 180
taaatttcng ttgcattaag tcctc 205

<210> 115
<211> 464
<212> DNA
<213> Homo sapiens

<400> 115
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ttaatcaact gaaaatnant atttntgaaa tccaagggca ataaaacccct gtggaagcnc 120
ccaccccccta cccattactc aaattcagac acnannagac tgcgtctgtc ttcatcctca 180
ccatgatgac ccttcatttc aagcaatgga atatttacag catcatagtg gagcttgggg 240
tacaagtggg gcatggtgct gatagccctg tgttcggtgg gacactgccc tggtggtggc 300
aactggtgca tgcttcagtt ctcctccttg atcctcagcc acgctcaagt cggtgtttgc 360
tgcgcaactc agcgtcgctg ctgcccctgc taatgagaat tacattgtca tgtaataagt 420
accttccttg agtncatgaa aataaaaaaa aagtcttaaa aagg 464

<210> 116
<211> 288
<212> DNA
<213> Homo sapiens

<400> 116
gtgagaagaa tacttgcatg cttctgcttt ggtcctttgg cacagcagct cttagaacat 60
aactgcctca ctcggagaaa gctggagaga cccacaagga gaaaaaagga ggctcccagc 120

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caacaaccag cacagctttg cagcaaaatg agttggccat cttagaagtg ggctggctag      180
atcccgttga accaccccac ctactcttcc tgaaacagac acaagccatc ccgctgagcc      240
ctagtcaaat tacagattca tatgcaaaat aaatgcttat tatttttt                   288

<210> 117
<211> 419
<212> DNA
<213> Homo sapiens

<400> 117
ggggatattt ttttttcata anacctgcct gtgatgtttc tctgccgtga atcatgtcta       60
tatcctcaca aaggataaaa accaaagcca ctagagcaga gtctttggat ttttctgaat      120
atggaaagca nccatgcatt acattgaagc atattccaac gtcagggaac agagcactgc      180
ttcctgtcca tgtcaccgca aattccgtgc tgagtgttac tgcgccaaag gacatgttag      240
gatgccacaa cggttctcat ctggtccgtg atactcacag gctgatgtng tacactagaa      300
agggagggct ctttccaagt tacagaactt attttgcaat atttcctggg aaagaattct      360
gctacaagct ttaatcaatg taagaaatgc tgtaactaca ttaaagtaaa ctgtacatg       419

<210> 118
<211> 469
<212> DNA
<213> Homo sapiens

<400> 118
aagcgccctc gagaagtgtc taaaggagac aagttgatag ccaaacaaca gttttggatt       60
cactgactga ttatgaaaga agcagtagac tggtatcaag aatcagtcag catgttcttg      120
agcatcctga gggcagggac cagccttgac gacccaccct ggcagaggct ccccagcagc      180
agctgctctg acgagatgtg ctcccaggag agagcaacac tgtgtgggga aagcccagct      240
ctgagaggcg gagaaaatgg gaagatcacc acctaggtgg gagggcggag aaagggataa      300
agaggagtac aaaataaaga tgaccttctt gcctaccagc aggctgagaa cagatggggg      360
agatcaactg ttagaaatat tttagagtgc agcaaaccac catggcgcat gtgtcctgtg      420
tacaaacctg cacgttctgc acatgtttcc caaacnttaa ataaattaa                  469

<210> 119
<211> 349
<212> DNA
<213> Homo sapiens

<400> 119
atcccatgga gcggatggag cacatgagcc aagggtaggc gggctcagta aagaaaagcc       60
caaatctctc ttcagctgta agttggccct tcactgggct gcactgacca gacctgaacc      120
tgactatgtc atcatgactg atgccaatgg gttcatatga ccattgccat tggtcaccgt      180
attagatatg gtgacatcac tttacacact tctgagtctn tccaggcaac ttgtatgtag      240
tgtgcagtct gaagcaatgt ctaatctctc agaagaagtt ctcaaaggaa tgtttccaaa      300
aggaccattt ttttccgata tattggaaaa taaaggctca cctaaaaat                  349

<210> 120
<211> 476
<212> DNA
<213> Homo sapiens

<400> 120
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cacatcacca cactgacatg cctcatgacc tgggtaaata caagatggaa aaattgagac      120
ccagggaggt tatttaccat gccagaactt gaacccagta aagatgggct ttcataatgt      180
tggccaggct ggtctcgaac tcctgacctc aagtgatcct tctgcctcag cctttcaaag      240
tgctaggagt acaggtataa cattggacaa aagaaaaaaa attgagaaca ggggaaagaa      300
gtttccattg tctctgaggc cttccataag agcgaatcaa gaactgacct tatttctcag      360
atctggatgt aaacatgtac tctttctgcc tcctgcatct gtgacctcac catgcccagc      420
ataagcttat gctgacccca aagtgtggca gtattattnc aactcaacaa gtttgg          476

<210> 121
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<211> 448
<212> DNA
<213> Homo sapiens

<400> 121
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ccttgaaatg agatagaaag tcatttggag ggacaactga atgacacact tctgttcaca 120
ggtaaccagg accacaagga accacaacag ggaggattac aggattgtgt tatcacctgg 180
aaaatcttga gataggaaag tacattttcc aggttccttc ttcctctggc ttccagacag 240
gttcagccaa tggaaaacac tggtggaaaa ttgaagtaca ggaggaaaca agaagccaaa 300
gttcattgaa aagttcagga aagaagaaag aagaattcat tgaaagaaga aaagaacagc 360
agtatggcag gngataaacc ccaagttttt gggtccnnnn nnnnnnnnnn nnnnnnnnnn 420
nnnnaaaagg gnncgggggg gccttttt 448

<210> 122
<211> 221
<212> DNA
<213> Homo sapiens

<400> 122
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agcacctgac aagaaagtgg ttatgtttct agagctgcat cagctattta taaccatgat 120
ggcaagtccc agagaactgg tcttgccatc actgagcagt tgaaccaata ccagcatcac 180
caactttcct gtatatgaga aaaataaact ctatttcttt t 221

<210> 123
<211> 389
<212> DNA
<213> Homo sapiens

<400> 123
gaacccccgg agcttctcgc atcgggtggg accggcatcc ggtgagaccg cggtggctct 60
ctggggctga aaattccaag cagagtagcc cgaggaatcc agccatcccc gagggttcag 120
aaatgcaaat cagggctgtg tattcacagc ctggactgga gatcgaccaa aaactatgca 180
gggctcaccc ttgcggggcg gcggctaaat ttaggaaacc aaccatctgg agaatgcagg 240
catcagaagc ccctgcagct aggaggatca atttcaagtt catttttatt cactgttcat 300
agatctccca gtttttccta gcgtgttcaa gctggaaagg atttcagaga ttgtgtcacc 360
tagatttatt ttacagaagg aggaactgt 389

<210> 124
<211> 261
<212> DNA
<213> Homo sapiens

<400> 124
aagacaaggc cgtggctatg ttgcccaagc tggtctccaa ctcctgggct taaacgatcc 60
tcctgccttg gcctcccaat gtgctgggat tacaggcatg agccactgtg cccagccctg 120
aaacaatatt cttgatacat aaagaacttc tgtaagtcag taagaaaaac actaacaatg 180
taaatattaa aggacataaa atagctaatg tacaaaaagt agaaatgtta cagttaataa 240
acaggagaaa tgcttaacct c 261

<210> 125
<211> 454
<212> DNA
<213> Homo sapiens

<400> 125
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gaggaccaag gaggctcttg taatatcaag atcaagcgtg ataagatggg gttttgctat 120
gttgcccggt ctggtctcga actcctgggg tcaagtgatc tgtccacctc ggcctcccaa 180
attgctggga ttacagacat gagccaccgt gtgcagcctg cctctgtcct tctgaaaaaa 240
agatggtaca gtcaagatga cctagctgta acctggctac tagaggacca aggagaaaaa 300

taaacttcta ccacgctttc gaaaacaagc actcaaactc aggagatact tgattgaagt 360
tgaaaaaagg ggngcattcc ccaaggcagt accctcatga atgggattag tgtcctttaa 420
taaaagagac ccaagagagg tcccttgctc cttc 454

<210> 126
<211> 238
<212> DNA
<213> Homo sapiens

<400> 126
accctgaatg ccaacaacca gtttgaagac ccccacagag gaacggatca gcatgagaat 60
gcaggtggtt cacctccctg tcccatgttc accctgcatt tttcgaccaa tcaacaaccg 120
ccaagcctgc ccctttccaa aacccttaaa aactctaacc caaactcctc agagagatgg 180
atttgaggtt tcctcccctc tcattcggtg gccctttgat taaacctttc tctgctgc 238

<210> 127
<211> 208
<212> DNA
<213> Homo sapiens

<400> 127
gacatccttc ccattgacac tggagggggcc aactacatgt tttaatcaga gcccacagct 60
gcccacaccc actgcagagt gagctactct ccaccaaccc tgcagccctg aagtttctgt 120
gaccactgaa gaggcctgtt ttcagactta gggtcaaagt gtgggtgacc tccaacacct 180
actgtagtga aggaataaat gtcaatag 208

<210> 128
<211> 384
<212> DNA
<213> Homo sapiens

<400> 128
gcttcactga gaagatgaac cngccgatga ggtgtgcaga gaactttggc tgcacaagtt 60
aagaggaaga ggctgagtct cagctcagag agtgctggta atgccaagca cagcagagct 120
gccagaggga tctacttgga atctggggag gccctgggga gactaactgg tacaatttaa 180
agagatgcaa agcaaatgat atgcggggca atcatgtgaa aagcctgctg ccttacagga 240
tggactccag ctgctcagtg ggacgggctg ttgggggctg ggttttggta gggcaagagg 300
gccccggatg gagtgatgga cactctaact cactactccg ccgtccaata cagtccagat 360
tgnttaacaa ctcttaaaaa taaa 384

<210> 129
<211> 356
<212> DNA
<213> Homo sapiens

<400> 129
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cctccgcctc ctgggttcaa gcaattctcc tgccacagcc tcccaaccag ctgggattac 120
aggcacccac gaccacgccc ggctaatttt tgtattttta gtagagatgg ggtttcacca 180
tgtnggccag gctggtttca aactcctgac ctcgtgatcc gcccaccttg gcctcccaaa 240
gtgctgagac tacaggcatg agccaccgcg cccagccaag cagacacttt tctaatacat 300
tttctgttca ttgtacaaat taattcttaa tgaatgaaga aattatttta atctac 356

<210> 130
<211> 252
<212> DNA
<213> Homo sapiens

<400> 130
gccctgcact cgatggatca gctggcacca cccagatcaa taaactggct catctggtct 60
tgtggcctcc atccaagtac caactcagtg caagaagaca gcttcgaccc cgtatgattt 120
aatctccaac ctgaccaatc agcactccct actccctggc cccctaccca ccaaataatc 180

ctcaaaaaaa cccagtctcc aaattttcag gaagactgat ttgagtaata ataaaactct 240
ggtctcccgt cc 252

<210> 131
<211> 456
<212> DNA
<213> Homo sapiens

<400> 131
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tcatcagcag ctggctaact ggggaactga aagtcacaag gcgctcgttt ctgataactc 120
catgaaaatt cactctgggt cagaaatcaa tctttggagt tctgaacatg cagcttttct 180
catgggcctt ttggagaaca atcagctact cagccatcag agccttttttt gctggatggc 240
aggcaggaac tgacagcaaa ccatcgtctc tacaacacgc agaagatcag caccaagtct 300
ccattctccg aaaacatgtg tccatgcagc tctcccangg gaggtctgcg ctgcagtgga 360
angcccccaag aagcgtggga acccancttc atcgcatgaa ggaaacncag agttgtacct 420
ccagatgcca ggcggagcgg cgacgtgacg cacggt 456

<210> 132
<211> 462
<212> DNA
<213> Homo sapiens

<400> 132
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atcagtttaa ctgaggaatc aatttgcttc cttccatata tgccaaggaa aaactgtaca 120
tagacattga cccacaatac ctggttgacc acgggatccg caagagatgt ccaaattatg 180
aacttccatt aaaaaaaaac ggtggttcta tggctgcctg gaatggccat atttaattgc 240
tccccaggat aatagcattt attgttaaac ttgctagaaa cataacaaaa acgtaaatgc 300
taatctttaa aataagcagg actcctatca catccttctc ttgnggcttt tttccctata 360
cccctgcttt gggaaccggc ttgtttggan tngaaaaagg ctctggaaca ngggattctc 420
acctcancac tgttnacatg tgggacccaa aattttggga aa 462

<210> 133
<211> 356
<212> DNA
<213> Homo sapiens

<400> 133
gggcattcag nataagccat catataccct gngaccngcn cgcncacntc tcagatggcc 60
ggttcctgcc ttaaccgatg acattncacc acaaaagaag tgaaantggc ctgttcctgc 120
cttaactgat gacatggtct tgtgaaattc cttctcctgg ctcatcctgg ctcaaaagct 180
cccctactga gcaccctgtg acccccactc tgcccgccag agaacaaccc ccctttgact 240
gtaattttcc tttacctacc cgaatcctat aaaacggccc caccccctatc tccctttgct 300
gactctcttt tcggactcag cccacctgca tccaggtgaa ataaacagct ttattg 356

<210> 134
<211> 245
<212> DNA
<213> Homo sapiens

<400> 134
aaggagctga gtctccccag aagaggaagt ttcaactgag cgattctctg acagaacatc 60
gtggattgag aggaaataag aatgggtgtg cctgctttag gattacacag tgctggacct 120
ttgaggaagg agaagcagag atggatagaa ttgttgtggc agaactgagc ttgtatactt 180
ggtcctgtgg agggtatcta ctcttcttcc agctgcgtag ggtaaataaa ggtttttgta 240
aagct 245

<210> 135
<211> 385
<212> DNA
<213> Homo sapiens

<400> 135
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tttggtctcc atcccaaact tgctgacctg tgattgttca tccactgcca gccatctctg 120
tcctccacct gcacctggga cctgttgccc tgcacccatg gacaatctcg gcttccatcc 180
agctccactt tgcgctctct ccactcttga atcgcatgaa cccaaccaac tggttcatgt 240
gtttattttt catttccttc ttttgttcta tgtaagtgtt tgtttatttt ttaacctttt 300
tacttgcctt gaatcctttt tggaaataga tgaggtctaa attaaaattg taataaataa 360
caccgaacat agccttttta aaagt 385

<210> 136
<211> 400
<212> DNA
<213> Homo sapiens

<400> 136
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acctgatgaa acggccccat ttgagcgcct gctgtatcgc gttggctctg cttcctgcag 120
ctgtgctcca agatgagcct ttcagacatc gctccctaat agctccatct cccccagtcc 180
aggaggatgc gcattcctct cctcattcac atgcaccact tcaagccatc tgcacgctct 240
acaggggact tgccgcctaa catcctaatg tgcaacccca tccaaatcct ctgctggaat 300
ctcactattt gcaccactta cgctccngga gcgtgaaaca gaagggccag tcctcttgtc 360
tctttattct aagtgnttaa tacagattcc atgggcttgg 400

<210> 137
<211> 216
<212> DNA
<213> Homo sapiens

<400> 137
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caggacacgc acacaaagcg agggtcagcc atgtgaggac agtgagaagg cggccgtcna 120
cacgccaagg agagaggcct gggaagaaac caaccttaca ccttgacatc agacttctgg 180
tctccaaaac tgtaggaaaa taaatttctc ttgttt 216

<210> 138
<211> 450
<212> DNA
<213> Homo sapiens

<400> 138
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tagctgctca ttcaggctag taatctcata tgtgttggga caactgagct tccagaatga 120
agagggcaaa ctgctgccag acagagtgtc actgtattgc ccaggctgga atggagtggt 180
gtaatcttgg ctcactgcaa cctccgcctt ctggggttc aagcgattct catgcctcag 240
cctcccgagc aggcgcacaa caccacgccc ggctaatttt tgtattttta gtagagatgg 300
ggttttgcta tgttggccag gctggtctga cactcctagc ctcaagtctg gtctgcctgt 360
cctgggctnt taaaagncct aggattacag gcntganccc cgacccagnc ctgattttat 420
ctcttgatca tctggattaa actgtaccaa 450

<210> 139
<211> 330
<212> DNA
<213> Homo sapiens

<400> 139
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ggagtatcgc tccttgaggg gctcctgcag cacctggtac ttggccttgg tgatatggac 120
cacttgattc aacactcttc ctctggttga atgggacatc cctgaaggca ggaccaatgg 180
cccgctcatt ctccagagcc tggctcatca tgagcccttg aggtactaat tgaaggagta 240
aattcacatt ctccttggac atttcctttc actctttctg tgcatgctaa tttactttct 300
ctagtaataa taaatgtcat tttgttttac 330

<210> 140
<211> 236
<212> DNA
<213> Homo sapiens

<400> 140
agaacctgga gatctgccca cccctccacc atatgaggac atggccagaa gacagtcacc 60
taggaacgag gaagcaggtc ctcaccagac aatgaatctg ctggcgcctt gatcttggat 120
gtccagcctc cagaactgtg agaaataaat gtcttttgtt tgtaagcaaa aaaaaaaggc 180
cngcgaggcc aattnagctt ggacttaacc aggctgaact tgntcaaaag gggggg 236

<210> 141
<211> 250
<212> DNA
<213> Homo sapiens

<400> 141
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gagagagtgg acaaaatggc tcttgtcacc aatggaatgc tctacagcaa ttcaaaagaa 120
agaaacacct ctacatatcg atggaaataa acaaaaacta ggtgcaatgt ggtgtcctgg 180
atgaatcctg gaacagaagg agaacatacg aggagaaact gttaaagtcc aaataaattc 240
tggaactttg 250

<210> 142
<211> 313
<212> DNA
<213> Homo sapiens

<400> 142
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agcacggccc attcatctag actcacgcaa tgactgtgat tccaaaagac tgaccaaaca 120
ttaccaagtg ggcaggctac tggggacaat tccggaaaca tttctaggaa gactggaaga 180
aatacagtaa tctagcacat atgcaaaaga atatcaaaag atgaactgtt ttcatcagcc 240
aacccttatg aatgctaaca tgtccagtcc tcttacagtt cgtcgctagg ttaatagagg 300
cattcaaaaa ttt 313

<210> 143
<211> 443
<212> DNA
<213> Homo sapiens

<400> 143
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tggtcaccca cttaaatgac gacatttctc agactcactt gtagtagaat ttatagccat 180
ttgatttagt tttggcctgt gagctgtaag ggaaagtgtt caatgatgca tcaggagagc 240
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tgcctggatc atggtggatg tgaaagctaa gttctgataa ctggcttgga ccatgagaat 360
aagggccccg ttgtangggg gggggaaaaa ttgngctgga anaaagaact ngcntctggt 420
atgacttcat ggagcttctg cca 443

<210> 144
<211> 342
<212> DNA
<213> Homo sapiens

<400> 144
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cctccgcctc ctgggttcaa gcaattctcc tgccacagcc tcccaaccag ctgggattac 120
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tgtnggccag gctggtttca aactccngac ctcgtgatcc gcccaccttg gcctcccaaa 240
gtgctgagac tacaggcatg agccaccgcg cccagccaaa gcagacactt tttctaatac 300

attttctgtt catttgtaca aanttaatnt ctttaattga at 342

<210> 145
<211> 393
<212> DNA
<213> Homo sapiens

<400> 145
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acctctgcct cctgggttca agtgattctc cagcctcagc ctcccgagta gctggaatta 120
caggcgtccc ccaccacacc agctaatttt tgtatttttc gtagagacgg gatttcgcca 180
tgttgtccag actggtccca aacttctggc ctcaggtggn ccgccccctt cagcctccca 240
aactgctggg attgcaggtg tgaaccacag tgcccggccc attctttctt tttcttagca 300
tccctatatt agtctgtttt cacgctgcta ataaagacgt acccaagact gggaaaantt 360
attgntnaca aaaaaaaaaa gggcgggggg ggc 393

<210> 146
<211> 281
<212> DNA
<213> Homo sapiens

<400> 146
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gaattggcct ccgctaggcc tatatngaaa ttctatatag ggccgctatg ngccaatttc 180
ttttgctttt taccctgggg gaaaggaaat acctcattag aagcccaccc ttctggtgta 240
ttttaccccc naattctttc aacaaaggaa aaaaaactgg t 281

<210> 147
<211> 472
<212> DNA
<213> Homo sapiens

<400> 147
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atggctaccc ttagacccct cgtgaagccc aagatcatct aagatggacc aagaagttta 180
tccttcacca gtcagactga catatcaaaa ttagatgtac gcatatagca gcaacccaga 240
ggcattgaca acagggtggg gagaaaaatc aaaggcgaga ccttgatccc caacattggt 300
tgtgggagca aaaagaagca aaacacatgc tccccagtgg ctttcaaaaa attctgnttc 360
cccnatgtca aaaanctgga agtgctgctg atgtgcaaca aatcttactg gctgagattg 420
ctcaacatgc ttctccaaga acgggtaaag ccctgtggag agagtaaccc gg 472

<210> 148
<211> 465
<212> DNA
<213> Homo sapiens

<400> 148
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gaggctgagg cgggagaatc gcttgaacct ggaagatgga ggttgcagtg agccaagatc 420
gtgccacctc actccagcct gggtgataga gtgagactct gtctc 465

<210> 149
<211> 434
<212> DNA
<213> Homo sapiens

<400> 149
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cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacgncccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcaca 360
caaaaaaaaa aaggnnnggg gggncnattt anttnggant taancnggnn gaaattnttc 420
aaaaaggggg gact 434

<210> 150
<211> 435
<212> DNA
<213> Homo sapiens

<400> 150
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ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct 120
taactgatga catggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc 180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcaca 360
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<210> 151
<211> 81
<212> DNA
<213> Homo sapiens

<400> 151
aatcaagatt tcactggatt tcccttgagg tgcacatttc ctggatgatt tccacttgtg 60
aaatagaaga agattcgttg c 81

<210> 152
<211> 198
<212> DNA
<213> Homo sapiens

<400> 152
aactcccagg ttctccaact acaacagatc tccaaaacaa aacaagcaaa actcagaatc 60
tgatggaaag ctgtttttaa aagacaaaga tggtggggaa aatacaatta atatctactg 120
acatctacta caccagccac tgtgagggga agtctacatg ttatcttata aaaataaaaa 180
caccccataa ccaccatc 198

<210> 153
<211> 367
<212> DNA
<213> Homo sapiens

<400> 153
cccaaaccat aaggnccatc tcaccttcac tgcaacaaag aagggttgtt aaagctggac 60
acagatttgc tcggcttcac cctctgatgt gttccacacc acttcacgcc acttttcaaa 120
aagatgataa aacgtcaggc tgagtagaac agaactgggt gcaaataaat ctctctgaag 180
ctaacttgcc tctctctacc cctacttccc tctgcacgtg cctttgcttt attcccctgc 240
atgagagaag cagtcaaatc tttcccattt tcatacctgg attgctgctc aacagcctca 300
acaactgaga cctgaatgta tccccatttt aaagaaccta acagaacatt aaaattgttt 360
cctgagc 367

<210> 154
<211> 408
<212> DNA

<213> Homo sapiens

<400> 154
cttttaagtt tcgggtgacc atttttgccc caaggcttaa caaaaccctg gaaaattgtt 60
acaaaagctg ccaagctcaa agaggctgaa agcccccatt gagtgccgaa gagtcaataa 120
tatctgactc aaagtcacga tgattcttcc gatacacaaa caaggccaca actacagaga 180
tcgccaggca aacgatcact gctatcacaa tcccaacata gagagcaaca tcatctgaat 240
caggagcggc tagagaggag agtgaaacat tgaaccagct gcttatagaa atttcccaca 300
gtacacatat gtattgctat aatttttca gacatttact gcctttttta taggttaatt 360
tcaaatctat ttcaaaagct atataaaatg gctgtggcct ttcagtgg 408

<210> 155
<211> 364
<212> DNA
<213> Homo sapiens

<400> 155
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tccttagcta gtatctccgt atatataaag atgtcaactt catcatcagt tcccagaaac 120
cctctccaac tgagtactgt attgtatgta atatgaacaa aaactatgaa aggaaagaaa 180
attgaggccc agagaatgca aaaaatgatt aaattcagag gcaaataact gagaagtagc 240
aaggccaaga acaggcatct aggttacaca tctctatctt cgagtgcatt tttctaaaac 300
aaagggcttg gacccacaaa ccatcacctg gaattgcatg tgtgactgaa agggaggaaa 360
ctgc 364

<210> 156
<211> 291
<212> DNA
<213> Homo sapiens

<400> 156
actccaaata agaaaatgaa agagtacaat tcaggagatg aaagaaaagg aaaatccagg 60
aaattcaatc agatctacat gactcatgtt gtgtcaactg caaatttctg atttcaaact 120
taaaaaaaaa gaaacttcaa ggacccttca aattatgttc aagtcatatg cctgatgaga 180
caattgaatc acattactgg actacatttt ttccccttga ttcaatctct tgctgccaca 240
aatatgtttg ttcagtgtaa atggagtgat aaagattgac ctttctagtt g 291

<210> 157
<211> 454
<212> DNA
<213> Homo sapiens

<400> 157
ttggggagct cctgcattaa gtnananctg angaaaaaga gaacagcgag gagaaaagga 60
taatagagga aaagagcaga aagaagccat ttatatctga ctgctgctgt gggagttaca 120
gaatctccct cttcaacttg ggccctttgc agatggtgtc tctacaaagc aaagtgaaat 180
ggacggtttt ccagctaatt tgttttgtat ggacagccaa gctggacact tgcagaccac 240
aaagtctgtg aatgagaacc tgggagctga catgagaaga attgagctgg agccttttgc 300
catcactgaa taaataactt accctcttga atccttacct gtacgactgg cataagacac 360
cagcctgcct ttcacacagc ttgtgatcta ataagataat gcttatgtac ctgttttaat 420
ataaatagac tgatattaaa atggcacgta acac 454

<210> 158
<211> 373
<212> DNA
<213> Homo sapiens

<400> 158
tacaaccaac tctgaagcca agggaccacc tttgcacatg agagacagtc atcaggaagc 60
ccaactgatc aatatgaaat cagtcatcca cggccgggcg cagtggctca tgcctgtaat 120
cccagcactt tgggaggctg aggcgggtgg atcacctgag gtcaagagtt ccagaccagc 180
ctggccaaca tggtgaaacc ccgtctctac taaaaatata aaaactaact gggcacagtg 240

gcgcacacta ataccagcta cttgggaggc tgaggcagga gaattgcttg aatatgggag 300
gcagaggtta cacagagcca agattgcgcc attgtgcgat ccagcctggg caacaagagc 360
gaaactccct ttc 373

<210> 159
<211> 391
<212> DNA
<213> Homo sapiens

<400> 159
tctggggagc tcctgnnttn agntacannt ntagggcatn actganagcc atctatcccc 60
tgngacctgc acgtacacat ccagatggcc ggntcctgcc ttaactgatg acatttcacc 120
acaaaagaag tgaaaatggc ctgttcctgc cttaactgat gacatggtct tgtgaaattc 180
cttctcctgg ctcatcctgg ctcaaaagct cccctactga gcaccctgtg actcccactc 240
tgcccgccag agaacaaccc ccctttgact gtaattttcc tttacctacc cgaatcctat 300
aaaacggccc cacccctatc tccctttgct gactctcttt tcggactcag cccacctgca 360
tccaggtgaa ataaacagct ttattgctca c 391

<210> 160
<211> 285
<212> DNA
<213> Homo sapiens

<400> 160
gtgcttatca cacatgcagt caatgaacac ctcacaaatg caaggttcac atgcagtctt 60
cgatgaacac atcgatcgca tccagcagta tgtctgtatt ggaaaagtcc ttccatagca 120
cccagtaatg aaaaggaatg tggcggggag cagtactgga cagtaaaact aaaaacacca 180
ggaagatcac agtgagatca gcagagccct agaatggcaa atccatgaca aagaaaattt 240
ctgatgaata aaaacgtgcc tgggtccagg ccagcaattg gcttc 285

<210> 161
<211> 180
<212> DNA
<213> Homo sapiens

<400> 161
atgccgtttg gagtagctac tttgaggaca agagacaaaa agcctgagga gaaagtcacc 60
atgaaggaaa cagaaagact aaacagcatg cgtgatcttt gattcagagt ccccatctca 120
ccctggactg ccttcctttg gaattccctt gtggaaaaaa aaattaaact cttatttggt 180

<210> 162
<211> 235
<212> DNA
<213> Homo sapiens

<400> 162
gccctgcact ngatggatca agctggcacc acccagatnn ataaactggc tcatctgntc 60
ttgtggcctc catccaagta cngactgagn gctagaagac agcttcgacc ncntgtgatt 120
taatctcnna cctgaccaat ctgcnctctc tattgcttgg cccnctaccc accaaattat 180
tttcaaanaa acccactntc naggttttca agaanactga tttgagtaat aataa 235

<210> 163
<211> 588
<212> DNA
<213> Homo sapiens

<400> 163
ggtccaaact ttagggtccc caccttgtta cttgcaatga aacggacaca gtggaagaca 60
gcttggagta ggaaaaggac tgaagactgc agcagccagg tgaacttcta ttcgtccatc 120
aagacccaac ccaaagaaac ccacttgaag ccaggcggga gggctcacgc ctgtaatccc 180
agcactttgg gaggccgagg ctggcggatc acctgaggtc gggagttcaa gaccagcctg 240
gccactatgg tgaaactccg tttctactaa aaataaaaaa aatagccggg catcatggtg 300

ggtgcctgta gtcccagcta ctcgagaggc tgaggcagga taatcgtttg aacccgggag 360
gcggaagttg cagtgagctg agattgcacc attgcactcc agcctgggcg acaaagcgag 420
actccgtctc aaacaacaac aacaacaaac tacactctag tctgggcgac agagcaagac 480
cctgtcttaa aaacaaacaa acaaacaagg aaaccccatt tgtaactgcc actaattgga 540
ctatacttct ggtgggccat cttcaagctt cgggcttgaa taaaccct 588

<210> 164
<211> 342
<212> DNA
<213> Homo sapiens

<400> 164
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aagatccgaa gcaatatcag aggccactgc acccagcagc agagatgaga acaactgaag 120
ttccaaatag atctatggca agctcaaagc taaggtcata aaatgttcta tgaaagcaag 180
accatgggaa gaactggcac atgtgtttgg gaagaggaaa aggttattga gtgcctacta 240
tgtgtcaggc actgagctga atgcttccac atattaatgt tttatacttg agttttcatt 300
aacagctcta atctgtacta ttaataaaag ataaagaaat cc 342

<210> 165
<211> 350
<212> DNA
<213> Homo sapiens

<400> 165
aaaatagttg gagaaatcta aggttgaaaa caacatatgt tctctatatt aaaacgtcaa 60
gagctgtact gaggaagttt gtggagtggg tggtagtgat agagacatac tcaggaaggc 120
tggacccatg gaggctgccc accttgttca ttgatttcta cttgattgat tccttcttga 180
ttgatttcca ggatctctga aacgagaagc cctccccttt atatgtttaa tcagatattg 240
caaagtggac ctgagaacga gcctgtcgga agcagattat gaaggggcct atgttttgaa 300
tatgctgaac tgctttggtt tgtgactggg gaagattaaa ggcctacaac 350

<210> 166
<211> 348
<212> DNA
<213> Homo sapiens

<400> 166
agtgtgggat tttcagcaag aagcagctgc tcagtcaggg gctacatgcc ccagcacccc 60
ttgtatctag gtggtgccat ataactactc ccaccaatgg aatggaaagt gatttgagca 120
cctctaggct gagggaggtg gaaagtgatg tgccttctcc gtgctctctt cctccatctg 180
ccaaacagac acaggggact ccaagaccct agggaatgga agagcaaccc atggaagggg 240
cctgggctgc tgaatcactc agggcagggc tccaccggtg gagtgaccac cagtctgaaa 300
cacctatgtt ggactgagtg agaaataaac tctactgtgt taagccat 348

<210> 167
<211> 574
<212> DNA
<213> Homo sapiens

<400> 167
gtggntntgt ccttttggac caattatcta acctgggcct ggactccatc taccactgtc 60
ctgcctggtt cactgcagct cacttcatct tcctgtgcct tctctgaaag ggcccctcca 120
aaagtttcct ggaaactctc aaacaactga gaaggtgcct cgacatctga tttgccccaa 180
acctctatac attggacatc ttctgaataa ggctgtgttg tatgttggga caagcaaagg 240
gatggaaatc aagaattctg ggttttagtc ctgactgtca ctacatggct gtgttacttc 300
tgactctgtg aagcagaact cgggcctcta gcgtctgcta gtctagatct aaaggtgttt 360
cctgagggac agtttggcct ggcatgcagg tacctctgca gaccacaaca gtgcaccgaa 420
aacacccct cccagcacgc acacaagtct ggctcctcag ccaaacatca aacaccaaca 480
ctgctgccca tgccagatgc caaagtgaga taatgtgtgt tataccctta agtgngntac 540
aaagagaaaa gattaataaa tgttagctat cctt 574

<210> 168
<211> 240
<212> DNA
<213> Homo sapiens

<400> 168
catgtgagta ctcagaagac agctgtctgc aactcagaaa gaagtctcac caaaaactga 60
agcctaccag gaccttgatc ttggacttcc ctgccagcta gaactgtgag aaaataaata 120
agtacatatt tgttgtttgc accacccagc ctataggatt ttgttatggc agccctagca 180
gactaataca tgcngtgttt tgatataaat ttattaaaga aacttcttta tttgcttacc 240

<210> 169
<211> 454
<212> DNA
<213> Homo sapiens

<400> 169
acctcaacat gttttatctg ggagtcttcc tctttcatga cattcacagg aggcctatgg 60
tgtgccaggc cccgtggaca gcactgtgga cacagatgcg taataacagt tcctaccttc 120
cagatagaga ggcaagaaag ggctgtggaa gcaaacccaa ggtactaagg aagccgggaa 180
gagaacctac tctagacttg gaagttgaag gggtcaagaa acattcctag agaagatacc 240
tgagtcttga aaactgagaa ggaattagta acccaacaga ggtgggaact ttctgaggac 300
ggagatggag aggaagatgc tgccagctga gggaccacca ttctgaaagc taggagaaag 360
tgcgcgatgg aaagtgggcc tgagggaaag gctgtaagca cctcactatt aatcacaatt 420
ctccctatag gaaaataaat gctgtttcta cttc 454

<210> 170
<211> 262
<212> DNA
<213> Homo sapiens

<400> 170
cccactggct tccttacacc tcctcgaaca cgccagatgt tacctgacgg ctcttgccag 60
aatattctct gcctggaacg cgcatccccc agatatccac gtggctaact ccctgacctc 120
ttttgagtct ctgctcaaat gttatctctt cactcacaca caccnttggc actctactca 180
aatttacaac cagccaccta cccccagcca aaactctgct agaaaaaaac ggtatttacc 240
ataaagtcat tgccaagctt gt 262

<210> 171
<211> 297
<212> DNA
<213> Homo sapiens

<400> 171
atggtgtttc gctcttattg cccaggctgg agtgcaatga cgtgatcttg actcaccaca 60
gcctctgcat ccaggattca agctattccc ctgcctcagc ctcccaaaat gctgggatta 120
taggcgtgag ccgccacgcc tggccagcat tcccaatttt taaaaatgaa tgattggcac 180
aaatcttaga aagccatttt ctgtagattt gaaagcaatg ctatttacat tgttactact 240
ttcttgttaa atcttgcatg tctgcagtat gtgttgtaat agaaacctaa gattatg 297

<210> 172
<211> 113
<212> DNA
<213> Homo sapiens

<400> 172
ctggactccg tcccatagat gagctgaagc aaaaggacct tcacacagaa cttttatcat 60
cagcctgagg aaaagtactc gaaggacaag gccattggtt gggaacttac acc 113

<210> 173
<211> 466
<212> DNA

<213> Homo sapiens

<400> 173
cagggcctaa gctgactttg caagagatct cgctaagcct ttctgcagat gcttgcccaa 60
tctggctggc cctgctggag gatatatgct gttaaggcaa ggcaggcaga ggcagctctg 120
gctcgtctcc acgtgcactg gctggctttc cagaggggac aatgcacccc acagaccaca 180
gctgtcattt ggccatctct accttcaacc ttaccaagca cctggcctca gcacagattt 240
tcagagaaaa ctttgaacaa agcaacccaa cactgtattt gtagaattgg aagagacttg 300
gagccttccg aatgtgacct gactgctcaa atggagaaat gagaagtggg taagcttgag 360
cgcaagctta cactgnnagg tgggtggttg aaacgaaaac ctctggattc ctattaccag 420
gncaagtnnt actnttcagt ttatcataca nggctttaag gggagc 466

<210> 174
<211> 354
<212> DNA
<213> Homo sapiens

<400> 174
atggagtttc tctctcgttg cccagactgg agtgcaatgg cacgatctca gctcactgca 60
acctctgcct cctgggttca agtgattctc cagcctcagc ctcccgagta gctggaatta 120
caggcgtccc ccaccacacc agctaatttt tgtatttttc gtagagacgg gatttcgcca 180
tgttgtccag actggtccca aacttctggc ctcaggtggt ccgcccccct cagcctccca 240
aactgctggg attgcaggtg tgaaccacag tgcccggccc attctttctt tttcttagca 300
tccctatatt aagtctgttt tcacgctgct aataaagacg tacccaagac tgag 354

<210> 175
<211> 181
<212> DNA
<213> Homo sapiens

<400> 175
atcctcagtg tcatatgatg gctgctgtag atcctgccaa agaagataga gtatcttcat 60
cacaagccag ttcctgacct tcccactaga ggagctgaac aaatgtcatg acaatttaac 120
agaatagagc tacagaaaga gctaacagaa tagagctact catcatcatc ctctagcctc 180
c 181

<210> 176
<211> 240
<212> DNA
<213> Homo sapiens

<400> 176
gaaagttgtg tttttgctcg tcgactcaag gcctcgagga ctttccccac ttttttctat 60
ggcacacaga gttctgcacg tgaacttctt gctggttaac tggattgcat caaaatgatt 120
tctctgtgag gtactattgc taccaggata tcaattacta tcctaatgtg gacatttgct 180
ctgatatgca taacaattga aaatagaaat aagcctctca gggcaatcat ttcaattcac 240

<210> 177
<211> 173
<212> DNA
<213> Homo sapiens

<400> 177
ccaccctcct cctaactttg gacagagctt actccagaag acagtcttgg agtagaacac 60
catggaccaa gtacttgccg agcatgccca ctgccctcga ttgtacatgt gcaaatactt 120
tctttgccta ttcagaaatt agcagaaact gttgaataaa gggataaagg agg 173

<210> 178
<211> 317
<212> DNA
<213> Homo sapiens

<400> 178
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aatactgtgg tatttcctct taaatacaat cttccagggc aaggcatggt attccagata      60
acacaccaac aatggatcca ttctatggct tcacaaagtc aatcttggag aaagaaccgc     120
caaaagctgg cacaagcagt agcaccttta cagtgggcag gaaaacaacc agaagtcttg     180
gggctgcaga gatccaggcc ggcgagaagt ccagagcatc agacaggaag agtttcctgg     240
gggtaggaac agtgactggc acatgcggga taaaagttca tgaaagaagc cgaatcgatt     300
aaaggaaata aaaaggc                                                    317
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<210> 179
<211> 170
<212> DNA
<213> Homo sapiens

<400> 179
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ggacaacgtc ttgctatgtt gcctggactg aactcgaact acccagctca agcaatcctc      60
ccaagtagct ggaactacag ggtcgcactg tgttttatct aagttttaag aatatatatt     120
tcaccccaca ccctcttgcc atgagactca ataaaaatat atatacaggc                170
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<210> 180
<211> 220
<212> DNA
<213> Homo sapiens

<400> 180
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gttatcaaag agtcttcagt ttggtggagg acggatttgc tctaaagctc tttagaagga      60
gaaagagaag cattctgcag gaaccctaga aatgaaacgc aaccagcaag ctgccatttg     120
tccagagaag ctcacactcc ctgggaaatg gaatattggg tctcaacctg aagagtagct     180
ggacagagac aggaattcac aaataaaagc tttaaaagat                           220
```

<210> 181
<211> 360
<212> DNA
<213> Homo sapiens

<400> 181
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ggttttcagg gccaccacca tccagacctt cggaaaccct gcactggacc aacacccatg      60
tccccaggac acctgaccct aaactcgccc gtagggcctg ttgatgcacg ctaggagttt     120
cctgatgatg cccagcattt ccctacctcc ttccctcggt ctaatctcag ccccttctca     180
tctccacagt gctagctgct ctgttcccat tttgtcccac ggtccagcac tgggcttttc     240
gctgacccgc taccatgtgc catttattta tctggccaga cgctgaggct cagaggttct     300
gcttcctgat acgggacctg gcacaccaaa ggagcccaat aaatgtctag ggagcgaatg     360
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<210> 182
<211> 362
<212> DNA
<213> Homo sapiens

<400> 182
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acctccagcc ttcaaatttc aatcataact tcagctaaaa gcagcggcgg gacagacgct      60
gaagggaagt gacacggagc taacgcacag cgcttccaga gacactttct ccgctttctc     120
gcagctcctc cgcacggcgt cctgtgggcg gccaccacac cgcaatctat tctgagtttg     180
caagtggaaa ttaaattcct tgtagccgaa atgagccccc acttcaatca gcctgaagcc     240
tgtcctccca tcccccaccg ccctcccgct gcagcatctt ttgaatatgc aaatggaca      300
ccttgctaaa tggtcagcag gattgatcct gctgttttca tcaaggaaat aaaattaaaa     360
cg                                                                    362
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<210> 183
<211> 438
<212> DNA
<213> Homo sapiens

<400> 183

gtctgagccc agggagctac ttctggagat gctgtggtct ggggtggatc ctgccttctc 60
agcccctgcc tgttgaagtc actgaagtct ctgctgcatc tccgggcttc tgctgagcag 120
ggctggaagg tcttgcttga ggagctgaag cccaccagca ggtggcagac aaatccagag 180
ggtattcatt ggaggatgaa gatttcctgc ctctgctcan gattctcacg gtgtggctgc 240
tgcagggaag tcagatcacc tacgtggagg cccaggggcc tggctctgga aacaggaggc 300
agaagctgcc agtctctant cttgggcctg gcanctggca taacattact tccccccctat 360
tccntcgntn aaagcagcac aagaacccca ccttnntttt cannagngaa aggggctang 420
gaccccgcct ttctattg 438

<210> 184
<211> 462
<212> DNA
<213> Homo sapiens

<400> 184
attggaagaa gttgttagct tcttttctca gaacggacat gtggatttgg ggcaaggaag 60
aaaagcaaaa gcaaaagccc aaacattcta acgcaggaat ggcgttcgaa gatctgcaac 120
tatactactt ggaaatgatc cccaggctaa agtgaccagg gaagtgaccc aaaaaacaaa 180
ttcttcttga cttttaaggc aggtgcaact gtggacagct gaggtcccct ttgaaattat 240
cttgccatcg taggatgggc taggatgact caactcttta aatgcatgtt aaagactggc 300
tactgtattt actacattct ggcctcattt tttttggtta tgattttgaa actcagaatg 360
aacaatacca cgtgtgtgat gatttagtcg caaaaaaaaa aggccagnga ggccaattca 420
gctnggactt aaccaggnng aacttgntca aaaggggggg ac 462

<210> 185
<211> 241
<212> DNA
<213> Homo sapiens

<400> 185
gtcttttgca gctgccttgg gcccttagcg cccacgtccc agacccggac ctcttggctc 60
agatcttgga tgaacctagc aaccttgagg acagacaggt aatttcaaca ttttctcctg 120
tggaaggcag aatccctcct ccttctctca aggatatcca tatcctaatc tctggaacct 180
gttaccttac acgatgaaaa gaactttgca gatgtaatta agtttatgac ctcatctcta 240
c 241

<210> 186
<211> 476
<212> DNA
<213> Homo sapiens

<400> 186
aaggaccagc gtgcaggagg ccctcaataa atattaactg aatggatgat tcaagaatta 60
ttccagtcct aaacatcaaa gatttccagg tgatgttcaa gagaaactat tcaaactaag 120
aattgcctgg aagagtggat tctagaagga agaatgggtg actaagantt actcacatat 180
cagaaaacca gaaaattcag aagatcttag cgatggcacc accacccatt caccagctta 240
atctagaaac ctggacatca tcattgactc accttgatga tgcaattaac cagcaagtca 300
tgacctctct gctttcaaat tttttcttga aaccatccat atttctccat tttcactgcc 360
actggcccat gccaaaccct catgtctcct ctagagcttc ctacattttc ttctagctag 420
atttcctcta aaccacttta cacagaaaag ctaaaatgaa tttctttaaa aaacct 476

<210> 187
<211> 226
<212> DNA
<213> Homo sapiens

<400> 187
acccttacca ccaccatgag aacaagctca ggctggcctg ccagaacatg gaaccaagca 60
gaatcatccc aactgaggcc atcctaggcc agcccccagc caaccctcag ttgacagcac 120
atgcataagc aagccctgtg cacatcagct gaacttgtca cagatcagca aaactgtcca 180
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<210> 188
<211> 90
<212> DNA
<213> Homo sapiens

<400> 188
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cctctggatt anaagggatg tttggatgaa 90

<210> 189
<211> 261
<212> DNA
<213> Homo sapiens

<400> 189
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gaattgtgag aaataccntt tgggngtgta tannctggnt aannncaagc tgaangggcc 180
tcgnnggcct ntatgantnc tatatggccg ntatggccna ttcnnnnggn gggnaccccg 240
naagaaatac tcataagcca c 261

<210> 190
<211> 352
<212> DNA
<213> Homo sapiens

<400> 190
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tcttccatac gactaaaatg aagaggaagc acaaggagaa atctggacac agagacagat 120
gcacacaagg ggaagacaat gtgaagacac gcagggagaa catcacgtga agacagagga 180
tgggaatgac gcttcaacaa gccaaggaac actaaagatg actggcaacc aacagtagct 240
aggagaaggc aaggaaggat tcccccatgg gttttagagg gaacacagcc tcgtcaacac 300
cttgatttca cacttctggc ctccaaaact gggagataat aaatttctgg tt 352

<210> 191
<211> 465
<212> DNA
<213> Homo sapiens

<400> 191
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tgaagaaaac tatgagaatc tgttggcaga ccaccctaag agaatgacta agtgaagtcc 180
tctaagcaga aaggaaacaa taaaagaagg aatcttggaa tatcagaaaa ggaaaacatg 240
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gcagcagaag tcagaattca gtgaggggac actgaaggaa cagataatgg nnctgnnttn 360
gcntggaagg ggnnntcaat ttgtaatttc agggttaact gcagaagtgt cttcaggaag 420
gctgcatctg caagccagga agagagaact caccagaaac caaat 465

<210> 192
<211> 134
<212> DNA
<213> Homo sapiens

<400> 192
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ggaggaactt cagc 134

<210> 193
<211> 421
<212> DNA

<213> Homo sapiens

<400> 193
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tgggggcccc cccgacccag gaactgactc agcgcaagga gacagctccg actctccatg 120
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ctgaaacact gctcacccag tgcttgggga gactgatttg agtaataata aaactctggt 240
cttctggttc tagatccttg aggaatcgcc acactgtctg ccacaatggt tgaactaatt 300
tacactccca ccaacagtat aaataaaaac aaaacaaaac naaaaaaaaa aagggccggg 360
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<210> 194
<211> 472
<212> DNA
<213> Homo sapiens

<400> 194
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agcgtgtccc tagagcgctt cccaagtcaa aatataaaca ccgctcgttc ccgcctttct 180
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<210> 195
<211> 367
<212> DNA
<213> Homo sapiens

<400> 195
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agctnccccta ctgagcaccn tgggnnnncc actctgcccg ccanagaaca accccccttt 240
gactgnaatt tttcctttac ctaccccgaa tcctataaaa cggccccacc cctatcttcc 300
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ctttatt 367

<210> 196
<211> 507
<212> DNA
<213> Homo sapiens

<400> 196
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cccattgctc aagcccatgt ggcctgtttg aaggagaact gcttatctgt gcagcaatct 120
atccgagggc ctttgggcca ttatgctgtg aatgtgacat ctgcagccaa gctctgcagt 180
cagagtctat gtaacaatca tggaagagta ttcgaaaaac acctgagtcc tccttctatc 240
tgcatatgcc tgaaagcagt ggtaagaaat atgttctaaa caagagtttc agattcatca 300
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gctattacgg ctggcatgga ccgtcttgtc acgatcactc ttcagatctc ctaagagtga 420
tgaataaggc tcctactatt aacttcaatt tattaanttt tctcattatg gcttcttctg 480
ngattctgct aaaaaaaatt tagccca 507

<210> 197
<211> 176
<212> DNA
<213> Homo sapiens

<400> 197
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tgctgcctga agaatttctc accatgtaaa cacaactctc ctaaagcagg cctttg 176

<210> 198
<211> 304
<212> DNA
<213> Homo sapiens

<400> 198
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atccaacagg actgtggtct tataagaaga ggaagactct ctctccacca tgagaagaca 180
caatgagaag gctgccatct gcaagccaga aggagagccc tcgctgggag gtcagccatg 240
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ttat 304

<210> 199
<211> 422
<212> DNA
<213> Homo sapiens

<400> 199
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gcagctcagg tcttggtaga gaagatctac cataaacagt gtagctacaa aatgctgaga 120
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tctccacaaa tgttgacgtc atgaagaaca agaaagactg aaaacctgtt ccagattgaa 240
ggaaattaga gatgtgacaa ctgaatacac cttatgatct gggatgggat cctagaccca 300
aggacattag tgggtcnatg gcaaaatctg acagaaattc aaggactgct tctctcatta 360
aataagcttt tcaaggaaaa aagaatgtnc tnaaagntgg atgaagatgt catttggcca 420
tt 422

<210> 200
<211> 308
<212> DNA
<213> Homo sapiens

<400> 200
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catatagggc ctactgtaat ccatttaaag gttaagtctc caccccagcg cgaacatgga 180
tgcatgctgc acacaattag ccaattatgc atgtctatgc ttcctctttg tgaatattca 240
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tgtcttcc 308

<210> 201
<211> 361
<212> DNA
<213> Homo sapiens

<400> 201
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gcaagcagat cacttgagcc ccggagttgg agaccagcct ggataacatc gcaaaatctt 120
gtctctacaa aacagacaaa aatgaggatc gcttgagccc aggaggttga ggctgcagtg 180
agccacgttt gagccactac actccagcct ggataactga gcaagaccct gtctcaaaac 240
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antnanccag gnnnaattng ttnaaanggg ggggacnccn aatntnnttt ttttttatt 360
c 361

<210> 202
<211> 333

<212> DNA
<213> Homo sapiens

<400> 202
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cgatgctggt aatgatgaaa taaggcaaca ctggggcaaa cactgttatg gccaatgacc 120
tatgcatcca angcagcttc ttcagcttca agttgggaca gtcgagcacc aagaagagga 180
tctacatcag cgtcttggta ctggtggtga caaagcagca atctgcctga ggctctgcaa 240
gcctacaaca ttctttttaa catccccaag ctggaaacac gtaaaatgtc cataagccac 300
agaaaaaata aataaagtat ggcattttct tac 333

<210> 203
<211> 128
<212> DNA
<213> Homo sapiens

<400> 203
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cactgggaga gattcattac ttcggtttta cctccggaaa aagctggagt caagttatgc 120
ttatttac 128

<210> 204
<211> 475
<212> DNA
<213> Homo sapiens

<400> 204
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gaagaactaa tgtcttctgc aacagccaac aagggcctta ggcctgccaa cagccatatg 120
actgagcttg gaagtgaatc ttctgagccg gccaacagcc cgtgatcaaa gccatcaagc 180
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aactgcaggg ccccttcttc acccctaacc agcaggaagt agccagaacg actgncacac 360
ggntcccaac aacaattggg gnggtctggt taaaagccag aattgaaagg aggngccant 420
tggcttcctg ggtcaagtag gggctcaaaa agctgngaaa ctcactcatt tcctg 475

<210> 205
<211> 356
<212> DNA
<213> Homo sapiens

<400> 205
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atctaactgc ttaaaatgag agcaggaatg gctgttggct tagatagatg gcaccccaga 120
gtcctgaaag aacttgcaga tgtgatcaca ggaccatctg aaccggagaa accgggggga 180
atggagagac agcaaaagac cggagatggg taaatgagtt ccagattttc caacacaaca 240
ggaaaggtga cttacgggtc tgtgtgctgg ttacatttaa tgttgagctt cagcaaaact 300
ccggaacaga tgattgaagg ggctttgtgc cgtatttatt taaagaaaag taatga 356

<210> 206
<211> 344
<212> DNA
<213> Homo sapiens

<400> 206
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gccttcaccc tcagctgttg caactctttt ggccactttg tgtaactgcc ctgccaagcc 120
ctgcttcctg gctgttcaaa gaaagaagtg tttcctacag gagatcacaa caaaaggatg 180
aaatctgggg tgcaggggaa gggtagcttc tgaagctgga aaataaagaa gtaaggaagg 240
gagactgtgg aatttaccag ggagggaaac taatatttcc ttttcatatt aagttgntac 300
tattctggct ttttaccatg atcatatatt atattcaaaa taaa 344

<210> 207
<211> 241
<212> DNA
<213> Homo sapiens

<400> 207
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cagccatgaa ttcctgggct caagtgatca tccttcctca tcctccagtg tagctgggac 120
tataggcaca tgccagcatg cccagctaat tgaagaaaaa cattttcaga tgaaattgtt 180
gtacatatat cttcaagtgt gttagaaata tacatcttgt gtattaaatt tatttgctca 240
g 241

<210> 208
<211> 457
<212> DNA
<213> Homo sapiens

<400> 208
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acacttgtga ctgcctcaat gaataggaag aatacagtgg aagtgatgct gcgtggctgc 120
taagaacagg ctggaaaagg ccatgcagcc tctgttcgtc tccctcttgg aacacttgtc 180
tttggaaccc tgagttgcca agtaggacat ccagggctgc cgtgctgtgg ggaagcccaa 240
aactagccca cacagagaga ccacatgaaa aaacactgac attgcatgaa gagagggtga 300
tgtgctccag ctgcctaagg cttcatctcc tgcctgttcc agctccagaa aacctgaagg 360
ccacagcatn agaccccttg nnttaaacca ttttacttga cctgttntga actttngacc 420
aatttnttat ttttgaccaa taaaaaataa ttttatt 457

<210> 209
<211> 482
<212> DNA
<213> Homo sapiens

<400> 209
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acaagcaagt tacctgcaga atccactgtg tcctttgatc tgtcacagca gctggggttc 120
ctgactttcc ctcttgttgc ccaggctgga gtgcaatggc acaatctcgg ctcaccgcaa 180
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agacatgtgc caccatgccc agctaatttt gtatttttag tagagacagg gtttctccat 300
gttgatcagg ctggtctcga actcctgacc tcacatgatc catccgcctc ancctnccaa 360
agtggnggga cacaaanccn ctngaccnng gctatnttgc tggaaattta ntaanngctg 420
gnggaaccat tccaatcttg gaaagctgca aagacaacat gttaatgatc aacacctggc 480
cc 482

<210> 210
<211> 349
<212> DNA
<213> Homo sapiens

<400> 210
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tcgagtggaa atggaatgca agcattcaga ctccagaact tgcactgtct tcagaaatgg 120
cctcaagtta gtggtttgct caggggtgaa gagcaaagca aagttcaggg cctcatccca 180
gggtgtgtca cttggcatga gggacgagga cccccatttc ctctcagctg aggggaagag 240
ctctccacaa tgtcccctg cacggtcctc tggctaccct gacaacaagg gccagctctc 300
cctactctcc ctggagtaaa gctgggctca ngaggtgcta cccgtttcg 349

<210> 211
<211> 350
<212> DNA
<213> Homo sapiens

<400> 211

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gcagagtgac attgcaccag tctgagacct acaccttaag gatgcctggc agctcctgct     120
tttgtgttcc tcggagtcat gagccacgaa gtcaagctac cctgctggag agaccagctg     180
aagaagcctc ttgaagagga cctgagactt aaggctcagc catcccagac tgtgagttaa     240
acctccagat gagtccaacc ccacctgcta tctgactaca gctacataga cgacaaacca     300
cctaagtgat tccagtcaac ccacacaact gtaaaagata ataaaagttg                350

      <210> 212
      <211> 478
      <212> DNA
      <213> Homo sapiens

      <400> 212
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actggattga tacaaccatc agttctattc agattatgga aatccagcaa ataatagatc     120
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ccaaagggat ggaaagccac agagaaatct cccaggagat gacacaggga tatcaagcac     360
atttggagcc tcctggaccc catttttttna acagatngtt ccatttccgg gaagctgccc    420
ggatttagct gctgtcaact gatccttatt ttgctgggat attcttcacc gattactt       478

      <210> 213
      <211> 472
      <212> DNA
      <213> Homo sapiens

      <400> 213
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cactttggaa ggccaagnta ggaggatcgc ttgaggctan gantcnaaac cngcctnggt     360
caacataaaa aagaanccng cttttcnaaa nnaaaaaatt ttaaaantta ggcccaattt     420
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      <210> 214
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      <212> DNA
      <213> Homo sapiens

      <400> 214
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gtgcccaagc cctgggcttt aagcctgggc tctgaccttc aacgtttgct tttcacacca     120
cacatcatgt caataaatag ttactgg                                         147

      <210> 215
      <211> 338
      <212> DNA
      <213> Homo sapiens

      <400> 215
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ctctcctgga tgggctgcca tcagggatca taggtctcat gagcagactg tcaccggatg     120
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tttataccgc ttgagtaagt ggtcagcctc ataaggagga gacaactgtg aagataaata     300
tcatgaaaac aaaacgagat taaattataa ctagacat                             338

      <210> 216
      <211> 363
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<212> DNA
<213> Homo sapiens

<400> 216
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ntnctgcctt aactgatgac atttcaccac aaaanaagtg aaaatggcct gtncctgcct 120
taactgatga catggacttg ngaaattcct tctcctggnt catcctggct caaaagctcc 180
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acc 363

<210> 217
<211> 236
<212> DNA
<213> Homo sapiens

<400> 217
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ccacaaaggc agaacagtga cagcagctca gcagcaagac tgctgggcac cgggcctggc 120
tctccaccac ctgactgggt aacttttcaa acaccttcat ttcccaagaa gtaggaatgn 180
tgggaagact aaataaacat atgtcaagta cttaattacc tgcccacata gtaaag 236

<210> 218
<211> 377
<212> DNA
<213> Homo sapiens

<400> 218
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aaatcttcac agaactaatg ttttgtgaaa tttactttga aaaacatcgt gctagaaata 360
acattatttt gctatcc 377

<210> 219
<211> 356
<212> DNA
<213> Homo sapiens

<400> 219
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taattttcct ttacctaccc gaatcctata aaacggcccc acccctatct ccctttgctg 300
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<210> 220
<211> 436
<212> DNA
<213> Homo sapiens

<400> 220
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actctctttt cggactcagc ccacctgcat ccaggtgaaa taaacagctt tattgcttca 360

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tcaaaagggg gggacc 436

<210> 221
<211> 441
<212> DNA
<213> Homo sapiens

<400> 221
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<210> 222
<211> 443
<212> DNA
<213> Homo sapiens

<400> 222
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ttgttgccca ggctggagtg caatgacgag atcttggctc actgcaacct ccacctccca 120
ggtttaagtg attctcctgc ctcagcctcc caagtagctg ggattacagg tggagtcttg 180
ctctgtcacc caggctggag tgcagnggag cgtgatcttg gctcactgca agctccgcct 240
cctggttcac gccattctcc tgcctcagcc tgcggagtag ctggaactac aggaagaaaa 300
atggncttan aangggaaaa ccanttgcan ccaagatcca aattaatacc aaggnagccg 360
gggagaanaa agaaccntgg tggaagaaga gtgaaaaagc nttgtctttt gggggtgaat 420
tgcagaaaga aaataaatta ttg 443

<210> 223
<211> 436
<212> DNA
<213> Homo sapiens

<400> 223
gggcattcag ataagccatc atatcccctg tgacctgcac gtacacatcc agatggccgg 60
ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct 120
taactgatga catggtcttg ngaaantcct tntcctggct catcctggct caaaagctcc 180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagttta ntggctacnc 360
attaaanaaa aaaaggcccn ggggggccnt tccggtngga attaacccgg gtnantttng 420
ttaaaagggg gggcca 436

<210> 224
<211> 457
<212> DNA
<213> Homo sapiens

<400> 224
ctatgaagag cagcccgctg tgggagacac tgatggccct cgctgactct agagtggagt 60
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gtcctgcgat gatccgaaca cgcctgttct cagaaatttg cagcacaatg ttgttatcca 180
agacatacaa tgaattgtcc ataggattta ctgcaaggtc tgttggccac tctaatcgca 240
cctgtgaaac gaacagaaca cataccatta ggttaccatg tctttccatg gacagtttta 300
acttgaaaaa aagaaaaaaa aattggtgta ttgnttcccc cgtcttatga attttaanca 360
ccattgggtg atgtctcgga aagtggaggg caggggagg atggttaatc acatgttctg 420
gtaaacgtac ttatcattta tgccatttac aatataa 457

<210> 225
<211> 105
<212> DNA
<213> Homo sapiens

<400> 225

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cagaactgag gacncagtgn ncatgtaact aactcctggn taagaggata tgggtagaan      60
gcacanggng cnacttccng gcttctgctc cttgaaacac agtaa                     105
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<210> 226
<211> 427
<212> DNA
<213> Homo sapiens

<400> 226

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gggcattcag ataagccatc atatcccctg tgacctgcac gtacacatcc agatggccgg      60
ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct     120
taactgatga catggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc     180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt     240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga     300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt tattggctca     360
cacaaaaaaa aaaggccagc gaggccaatt cagctnggac ttaaccaggc tgaacttgct     420
caaaagg                                                               427
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<210> 227
<211> 315
<212> DNA
<213> Homo sapiens

<400> 227

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gagacctgag ccactaagta agaagtccag ttaccctgtt ggataaacca catggagaag      60
gaaaggccct gagatacttg gagagaggga aaagtccagc tgcccagcac ctgagctgag     120
cccagcctca gccaacccca ccggctgact gcaaacacat cagtgaccac cagtaagacc     180
agcagagctg cacagccaag cccagcctag attgcagaat tgtgagcaaa taaaatggat     240
attgctttaa gccacaaaat attgaaatgt tttttaaatg tagaatgtga tttctaagaa     300
taaaaagttg caaat                                                      315
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<210> 228
<211> 415
<212> DNA
<213> Homo sapiens

<400> 228

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aaccaaacca acaccggaga agctgagcaa atgcagtcag ttggatgtga attacctttt      60
agttgctgac aacagaaagt taccctgaac cactgaccaa gggatgaaaa gcgtccgtgt     120
actattagta attctcagaa tcatctctgt ccccaaccaa gtatggaaag ccaagtacag     180
tatcatggaa ccaaattcaa atgctggtct caaagttccc gacttgcttg ccttcaagtg     240
ccacttgaga gattttaaat gacagtgaaa tgctttgttc aactaaaaat tcaaagtgtc     300
gggacaangt ttatttctga gactcaagag atagtttttg ctttagttgn tgccattggn     360
gntgntgggg ngggggaaaa aangncagaa aataaaatct gccacttttc ttttc          415
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<210> 229
<211> 350
<212> DNA
<213> Homo sapiens

<400> 229

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aattgtgaca ggctcccagg acctaaaccc agaaggaagc aggaccatat tgctgcctag      60
agaaggggat ggagcagatt ccaggacacc gatgaaacag aagcttccat cacagtgctt     120
tctgctacct tatgagacag ttcgcatctc aacagctcta ggatacaaag gaagcacata     180
catttatact ttataaggtg gccaaggaat cctactgtga acaaagaatt tctaagataa     240
taaaatccca cttttttttt ctataaaaag caaaaaaaaa aaggccagcg nggccaattc     300
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agntnggact taaccaggct gaanttgntn aaaaggggggg gactacccaa 350

<210> 230
<211> 91
<212> DNA
<213> Homo sapiens

<400> 230
tgacacgaaa atctggttct cttgcactaa tatgtgaact tatggacatg aatatttatg 60
agctaatacg agggagaaga tacccattat c 91

<210> 231
<211> 285
<212> DNA
<213> Homo sapiens

<400> 231
ataaggaaag cgaagcacag agaagtatct gcccaaggtc acaaaccagt ggagcaggat 60
ttgacccaaa gcagacagtc ggacttcaca gcccgtgctc tcaacatcca actgctgaag 120
agttaacaat ttacccttga cagccgctat aagcaaaggt aaatgctcaa ctgctaggaa 180
gggacagtca gaacaccgtc ccatatccag tatccatgtc tctctgtttg tttatggcct 240
ctatgacttt ggcaaaagaa gtacacacaa tctgattttc cgaac 285

<210> 232
<211> 71
<212> DNA
<213> Homo sapiens

<400> 232
atggtggagg attgctcaag cccaggaatt tgagaccagc ctaggcaaca tagcaagacc 60
tcatctctac g 71

<210> 233
<211> 155
<212> DNA
<213> Homo sapiens

<400> 233
ntataatggc tanagctgga aacacatcat gtatncagan ggaaaagggc aagaagattg 60
caggatccac agacctggta ttcccaaaca gctgaaccag tntcagtaca cctctggatt 120
tcccattact tgagataaat aaactctttc ttttt 155

<210> 234
<211> 428
<212> DNA
<213> Homo sapiens

<400> 234
gtatcgatcg caagagtgcc cccaatcaac tttctgcaag caaatctctg tttcatggag 60
aacctggcct gcaacatgac acctctcacc acatcttacg tcagcagttc ctaaatgtgt 120
gctgtggact tgctacagca gatatgtttg gagaaaaaaa ttcatatttc tcatgttcac 180
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gctcctcctc cactgctgaa tctagtgtat agcttgatgt agaaaccact gctataccaa 300
aggctcagcc tcaaatcagc ctacagcttc tatcttgctc catcttcgtt tcagccacca 360
atagagnggn gaagccatta aaaaggtcaa aagtaggtaa ataaaatgtg aaccagtata 420
taaaagtt 428

<210> 235
<211> 355
<212> DNA
<213> Homo sapiens

<400> 235
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gttcctgcct taactgatga catttcacca caaaagaagt gaaaatggnc tgttcctgcc 120
ttaactgatg acatggtctt gtgaaattcc ttctcctggc tcatcctggc tcaaaagctc 180
ccctactgag caccctgtga cccccactct gcccgccaga gaacaacccc cctttgactg 240
taattttcct ttacctaccc gaatcctata aaacggcccc acccctatct ccctttgctg 300
actctctttt cggactcagc ccacctgcat ccaggtgaaa taaacagctt tattg 355

<210> 236
<211> 381
<212> DNA
<213> Homo sapiens

<400> 236
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aaaggcgccc gaaggagcct tcccatccac cgcgggtgcc caggaaaggc ctgtggggct 120
ctcctccccg cgctccacac gccctcgcat cccaccgagg cgccagcttc tgcctgcacg 180
ttgctgaaac tggcctggag gttctgacaa gaattagagc ggcggccgtt gccccgggga 240
tgacctggaa gcgaaagaga ccggcacgaa ttctagagtt tcggggtttc cgcgggttga 300
gattgtacgg gaaacaatgc attaaccaaa cctaaaaatc aaacaaacac cgtctggnag 360
aaccttacca ttaaaaagct t 381

<210> 237
<211> 449
<212> DNA
<213> Homo sapiens

<400> 237
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atgccaggac acaagtcacc acctccccta tgcttagcct tgtcatcctc catgtcattg 120
aggccttcac gactcccact ctggaaccaa gcaatcaagg cctctgaatt gcactgttgc 180
actgaccgtt cacctcctta ctgtctgcct tatgcagagt gcaagctctg tgaaggcaga 240
tgcctcgcct gagtggtttc cagctgcccc cagagcacct agaagaggcc cagcaaatag 300
aaggcactcc atgattattt gataaaagaa tgaatataac ccaacacttt atggctcccc 360
ataactggat gccccccctcc ccatggtcag atccttttta tatttggtgg acatgacaga 420
aatnaatctt ccaaataaat gaattctta 449

<210> 238
<211> 366
<212> DNA
<213> Homo sapiens

<400> 238
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aagcccttcc agaaaagccc ggactttcca gaagcatcct cagcaagtgt cacaaggaag 120
gaagccagag gctgcccatc gcatacctga agagagtcaa cctagtctcc ttaaacattt 180
cttctgctcc acccctgaaa gaagcaatga ttaaactttg aagccctgta tatcttaata 240
ccttgggaac atttgctatg tatatcctca ttaaatgaaa acattgcaac ggcaaaaaaa 300
aaaagggccg gggggnccat tnannttggn nttnaccngg gngnanttng ttaaaagggg 360
ggggcc 366

<210> 239
<211> 370
<212> DNA
<213> Homo sapiens

<400> 239
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cccttttgac tgagccaact gaggctgctc ttgaaatcaa aatctatcat aaagtaagag 120
tgaagctgca gcgtgggtct acctaaaact caattcaaga aattcaagag aagagaacgc 180
tcagctagag tgaaccagga gactgcaaca atcttgttca tttggttatt cacttattta 240
atgtctgtat tttgtagatc tagattaatg tgaatttcct tagaacttgc atcttggttg 300

gtttactcag tgctatatcc ccaatgtctg acatagtacc tggttctcaa taaatacttt 360
gaaacaattg 370

<210> 240
<211> 305
<212> DNA
<213> Homo sapiens

<400> 240
gcctgaaaca caagcacaac acactgaagc taccatggat ccccttggcc cagcagctgt 60
tacaccctaa atgatattct cttctagcac ttccttaccc tgtggtctta atctgaaggc 120
atctggactc ttcttcctat tggtagaagg atcacaatat ggtgcataaa acctatttta 180
tgtaacagcc cagtggacct gaagcaacac ttcatagcca agtacattca tagttcttca 240
acaaaatgta taaatttcac cccttgttgt aataaataaa gacaataaat aaatagcctc 300
ccatt 305

<210> 241
<211> 448
<212> DNA
<213> Homo sapiens

<400> 241
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gtttcttcag atgttcagag cctgggagca gtaagtgttc aaaaaatggt gtttaagggt 120
ctcactccaa cacccaggct ggagtgcagt ggtggtgtga ttatggctca ctactgcctt 180
gacttcccag gatcagatac gggctttcac tgtgttaccc aggctggtct tgactcctgg 240
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cactagtggc ctcttctaag aggaaatttg gatatacaga gagacaccag agatgtgggg 360
gcacagagga aagacctgct tggatacagt aagaaaggca gcctctgcna acntaagaca 420
aagtcctaag aaaaacccaa ctgctcca 448

<210> 242
<211> 511
<212> DNA
<213> Homo sapiens

<400> 242
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ggactactgc ttaagtcana actgaggggc attcanataa gccatcatat cccctgtgac 120
ctgcacgtnc acatccagat ggccggttcc tgccttaact gatgacattt caccacatna 180
agaagtgaaa atggcctgtt cctgccttaa ctgatgacaa tggncttgtg aaattccttc 240
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tanaaaacgg gncccacccc taatnttccc tttgcctgga cttctctttt ttgggactna 420
ggcccacctt ggcattncaa nggtggaaat aaaancannc tttttttttgg ctctccncca 480
naancaaaaa atanaaataa tatagctctg a 511

<210> 243
<211> 425
<212> DNA
<213> Homo sapiens

<400> 243
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acttcctggg ctccagtgat cctcccccctt cagcctctca gcagagagag aaagaaagca 120
gagctctttg aagcagagaa agaaagcaga aagcagagat ctttgaaggc ttaagaaacc 180
ataaggagtt ttggagagtc aatgcatgat gatctctgaa gattctactg aaatctaatc 240
aatatgtcct cactgccatc aattcaaaag aacttgctaa gaaggctcta gaggcttgta 300
ctctcagata gtgaaagtga gatgatgtgt agtgaaagtc atatataggt tgtaaattgc 360
aatatggaat tcccaaatgc tgaattcatt ttatctcttc ggaaataaaa acctggtaaa 420
gactc 425

<210> 244
<211> 208
<212> DNA
<213> Homo sapiens

<400> 244
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taagactgcc agaagctgag agagagaact ggaacagatt ctccctcatg ggcctcagga 120
aggtcctccc tcaggccctc ttgccggcac tttgaattca aacctgtcgc cttcagaact 180
gggagacaat aaatgtcttg tttaagcc 208

<210> 245
<211> 256
<212> DNA
<213> Homo sapiens

<400> 245
tttgagacaa cctttcgggg tctgctcatc ctccatggcg agtcatcttg caatgtgatc 60
tgttgcatca gacctccgtc tgggatcatc tttttcctgc ctgaagttcc agctttggaa 120
tctccctccg gagggtctac cagtggcaaa ctcttaagtt tttgtatttg taagtgctat 180
gatttcacct acgttctgga tacatgtgcc tcatactggg tacataattc ttgaaataca 240
ttttcactga atatat 256

<210> 246
<211> 438
<212> DNA
<213> Homo sapiens

<400> 246
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tgaagaccac ctagctggaa tctcagaggg agagctgggg acaggaaagg atgactactc 120
ccaccattct gtggacaccg agtccagcct ccgggaggac gctgagggaa ccttttggga 180
cagccagggc agagaacgcc ttttacttct taaggctctg gatcaaaaca gagaagcttc 240
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ctgattacaa acaggaatac nggagggctt cctttaaact gcttcagaaa acaaactcct 360
cggggacttc gaaaggagct ctcaccatag ctcctgcaat ccactctgaa caggaaacct 420
tctcatctat ttattaaa 438

<210> 247
<211> 424
<212> DNA
<213> Homo sapiens

<400> 247
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gcggtggatg tgctaagtaa ctccacctcc ctggcgctga ggccagaaag cagacacttc 120
ctgcagctgc agttacacaa cgatgttctg tggatttttc gggcaatagt taatgattta 180
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tggcctctgt ctctactgca gccacggtgg aaacagagag caggaaaaag agcttggaag 300
aggaaccctg aagaaggggt ggacaccacg catcccagac ttctacacgg ctagaaacac 360
ccctgactaa tattattact aaagtgtata catggtggca ggccctgttc taggctcttt 420
acaa 424

<210> 248
<211> 194
<212> DNA
<213> Homo sapiens

<400> 248
gtaaagccat tgaagcacat tgagacaaga gggaccccag agggaactca ttcaccttct 60
ttccaacggg tgcgggtaca gaagtctgca gcctgcacac ggaagaggac cctcaccaga 120
gcctgacctt gctggcaccc tgatcttgga cttctggcct ccagaacatt gagtaataca 180

tttttgttgt gtat 194

<210> 249
<211> 300
<212> DNA
<213> Homo sapiens

<400> 249
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gcacagacag gagacagtgg actacatgat aaagcagcgg gaagattttg aaccctttgt 120
agaagatgac attccttttg agaagcatga ttcgtggtac agagaaaagc agcgtgaggg 180
agttacacat cgcatatcgg tatggagagc actacgacgg tgttcggagg atcaatgaca 240
actcaagagg cacctgcaca tctccagacg gattttcaga tgcttcatca agatgaagtc 300

<210> 250
<211> 471
<212> DNA
<213> Homo sapiens

<400> 250
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cctccatggg ctcaggagat cctcccacct caccctcctg ggtagttggg actagaggtt 120
gcatttcttt tttctggaag cacatctttt aaaagatatt tacatgaagg tctaccagac 180
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tgtataagcc caagctgggt aaatacaatg aaaaccacac tttggcacac cagagtcaaa 360
ctgagggaaa tcaaaaccat tattaaacct tggaaatccc ctttncnttn aagcacctnc 420
attaagataa atagctaatt tcctaaaaca aattatggga agccagaacc a 471

<210> 251
<211> 614
<212> DNA
<213> Homo sapiens

<400> 251
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ggaccccctt nccccaaagg gggaaccaag gccggaagga ccccccaaag gttccgggat 120
tgcccaccct tggccaaagg anaggggttt ttantttggg gggtaacaac ccgggggtac 180
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ggaagccaan aaaaaccgcc gccgaaacca agaaacctaa gaaaaccgaa acttggattt 360
gctcccctta gcaaatccgc attcattcng gtgcccaagg ggaccaccgc catttcatnc 420
aagatgaaac cgtgggcccn aaggtttgac aaaggggtcc acaaggcagg gtttanatgg 480
gccccgttta aaaacttatg cttnttnttg cgggggggccc attctntaag gaatggggggn 540
ggggtcaana atgaattccn tttntttccn aattggggcc naaggnccga tggggcattc 600
tttttaaaa aaaa 614

<210> 252
<211> 546
<212> DNA
<213> Homo sapiens

<400> 252
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taccagtgaa gaaggaggaa gaaaaaaact gctggctgtt ttacaggaga ttcttatttt 180
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tgaaataaaa gttaagctta tcgaagccaa agaagctttg gaaaattgca ttaccttaca 420
ggattttaat cgggcatcag aattaaaaga agaaataaaa gcattagaag atgccagaat 480
aaacctttttg aaagagacag agcaacttgg aantaaagaa gtccacatag aagaagaatg 540

atgctg 546

<210> 253
<211> 474
<212> DNA
<213> Homo sapiens

<400> 253
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gtccaccgcc ttccagctgg cccaccttat gaaagaagca aaccctgagg gcgtggagga 120
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gcaccgcgtt taacctcaga tcccaagcct ccaaatgggg tgtggtttct ccaaagggct 300
catgagactg atgtgtgagg acatgaggat gacatccggt tggtgtggcc actagaggaa 360
atgccntttt accnaggaca ggaagnaggg gggcccaatt ttcntttcca acatttcaaa 420
caacaaggng tatgtccgac ccccgattca actttcacaa acctgcactt aatc 474

<210> 254
<211> 496
<212> DNA
<213> Homo sapiens

<400> 254
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tgggacatca tcagaacctg aatgacaaac ttttggaagc cagggtctca cgctgtcacc 180
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ttcctgcttt aatctaaagc tttgnaccaa tgatgantaa ctnggaaaaa gaaggccttt 420
tccaagggac atcgctcact gncctgatgc ccgngcagtg nacacttacc gactcagntt 480
tccaaagatc ctcaat 496

<210> 255
<211> 377
<212> DNA
<213> Homo sapiens

<400> 255
ttcgtgtttg gttaaagaga gacagtggac agtattggcc aagcgtatac catgcaatgc 60
cttctccatg ttcatgcatg tcttttaacc cgggaacaag aagactgtcc ataggtctag 120
acaatggnac aatctcagag tttatattgt cagaagatta taacaagatg actcctgtga 180
aaaactatca agcgcatcag agcagagtga cgatgatcct gtttgtcctg gagctggagt 240
gggtgctgag cacaggacag gacaagcnat ttgcctggca ctgctctgag agtgggcagc 300
gcctgggagg ttatcggacc agangctgtg gcctcaggcc tgcaatttga tgttgaaacc 360
cggcatgtgt ttatcgg 377

<210> 256
<211> 245
<212> DNA
<213> Homo sapiens

<400> 256
ctccagcaac aactgtttct tgtgactttc tgtgggactc tgaggaatgt tgggatgata 60
atcacaggaa ccaatggctg cctctggaaa gcccataatt ctgcacattc atggagcttc 120
actctgattc caaatccaga aagaccacca tgtcacttat ggagacactt gaaatccttt 180
ccacatcttc actcatcacg cctggggtga gaactaggaa tacgtgaata aaccaataac 240
acgtt 245

<210> 257
<211> 721
<212> DNA

<213> Homo sapiens

<400> 257
agtcaagaaa acttgnnggg gcccggaacn cctatnttgt ncagntgggc nctntccttn 60
tgggntantt anaaccctnt nnggagactt ttnatgctgg gtggttgggg acccatttta 120
annggccntt ngaggggttt ttttttntta aagggttann ttttnaaacc gggcntnggt 180
nggggttttn ggccngnttt ttgaacaggt ccncttaaaa aaccagaagg gcttgccaaa 240
aagaaatggc ttttngnaat gggcattccg gctttcgnat nccttgaaaa attnccggca 300
aaacacttac gacttaggaa gntttgctta anggccaaac acgaaagatg ggcccaaaga 360
aaccaaaact cgtaaggggg actttccaaa accccaagta cttctcttgc ccaaacactt 420
gtacctcaag tttcatttgc ccaggaagaa gccatatgaa gcctcacaag tggccttgca 480
ctttacccca agtaagccct tggaaagtgg tgggggcccc cgtacccttt tgtacccaag 540
ccggggaagt taagccgcct tgctcttacc ttccttcctt gggtttcacc tatncccgct 600
tcacttggca ttgcccaagg gggtttcttn tttcttggag gggcaaaaag ccccaaccac 660
caccctggtc ttttttgggc ccactttctt tccaagccna aaaattaaga tttgggctct 720
t 721

<210> 258
<211> 345
<212> DNA
<213> Homo sapiens

<400> 258
accgtggccc catctattat ttttgaagag gaaaactcct ggngccaaaa agtccaccga 60
tccttggttc agacaaggac ttccaattgc ttaatgtcag atgaatactg aaaggtcacc 120
agaggataca ccacggaaca cagggacacc atgactattg aagtgttgaa gattccagat 180
gaaacgtttt ttaaaatgta agcctacact gcagggcatg gtgttgtgcc tggagtcccg 240
gctacgtggg aggctgaggt gggaggaccc cttgagccca gaaattctag tgcaacctga 300
gcaacacagt gaaacctcat ttttaataaa atattttta agcct 345

<210> 259
<211> 308
<212> DNA
<213> Homo sapiens

<400> 259
gatttctttt caaaagtgaa ctttggtgta gcctctggtc tggggcggaa gatgagaatg 60
agagggcagc ctgacccccc tcctgataag gaaggaccca gcgcataacc tgttcaggat 120
ctggagccgc acaaacacct gactcgcccc ttcaaaacaa gatccgcgga atggctcggg 180
acacaacaag aaattgccgg caacctgtga cggctcattt ttaccgacag tgggaggcgg 240
gcagtcggaa ggaatgccca tttctccggt gttccttccc agaagcaaaa gaacgtgttt 300
gtttatgc 308

<210> 260
<211> 517
<212> DNA
<213> Homo sapiens

<400> 260
ctgggagctc ctgcgtgagc tcntgnntta ngttagaant gcggtgtgac cacaccaggc 60
cagggaagaa acacgtgccc agcctgccat ctgccctcct gtcttggagc caggtctttc 120
caccagcttc cttcatcttt taacacttgg tgaaaaggaa tgacacgtca gtcaaagccc 180
ctggccggtg ctcatggagc atctggcagg aggaagcccc ttcctggctg gcctcccatt 240
catcagtcag cgccgcaggc tgggccaggg acagctgtgg aacctgagct gggaggcagc 300
tgtgaaaggc aagaaacaag gaaaggggac agaagtcacc cggtcggtga gccagctcgg 360
aggcaggcag agaaagcaag agaaggggcc tctcctgccg tcatcctaac ctcccaggtc 420
ctccccaaag gctcccaacc cttcccaaac actccccagt ctccttcctg tccccaccac 480
catccctntg gccctgattt acaagctggg cagtcac 517

<210> 261
<211> 94
<212> DNA

<213> Homo sapiens

<400> 261
ggcagcccca tgaatatgaa gatacttgga aagtctttac tacagagcat gatttcagga 60
atgatgaaac aataaatgag aatctggtat taat 94

<210> 262
<211> 342
<212> DNA
<213> Homo sapiens

<400> 262
ttaagtcgaa ctgnggagag gaanagaaag acagagtnnt gttctgtngn gcatgctggc 60
gtacagtgcc acaatcacag ctcaccgcag cttccaactt ctggactcac atgatccttc 120
tgcctcagac ttccaagtac ttgggactac agtcacgaat caccacancc agcttggann 180
ganttttta ngggnaaana ccagtcaatt ggaactggaa ttatatgact tggggccaaa 240
ataactgtgg tcagctgact tgttaccgta tttaatttta attttggagc ttgtattcaa 300
aagctattat atgaatataa gaataaatga tttttttaac at 342

<210> 263
<211> 520
<212> DNA
<213> Homo sapiens

<400> 263
ttaagttaga tgtntggnna ggaagngaaa gacananaca tgaanggagg anggnccnag 60
nnnggacnnc aagatgccat ctataagcca aagagaagcc tnagangaag ccaaccntgc 120
tgacaccttg ttcttggact tctagctttc agaactgtgg gaaaagaaat ctgttgagtc 180
atccagtctg cagtactttg ttatagcagc ccaagcaaat gaatatacct tccttgacta 240
cttcatctta taacgtgcaa atacctcaac ttcagcacca tttacatgtt tattcactgc 300
ctttattggt agtcatttgt gtcttcccca gaagactgaa gctattaaaa gactgataat 360
ctatttnata tcttttggna ttatcaagct caacatggta tcttcccaca ataaaaattt 420
gactttctgt actcttcctt ccattaatgc ccgagtgaaa atatggctgg tagtggtttg 480
ctgaagtaaa gcggattctc ctgcctgaaa aaaaaaagaa 520

<210> 264
<211> 566
<212> DNA
<213> Homo sapiens

<400> 264
tgtacaactg tgatccaagt caacgtcagc cataaatcct tcttcaaaaa attcactgga 60
tacctagaag aaaatgaaac acctttactg ttacattatg gtacctagcc tccaagaaga 120
ccccgttgtt ccccactctt ggtattcaca cctttgtata gttccctgct cactatacca 180
nagcgggtct gcgtgaccat aaagaagtgc ggaagtgtcg gcgcatcgtt tctgagacta 240
gtttataaaa ggctgcagct cccatctctc tcagatcact tgctctgggg gaaaccagcc 300
accatgcagt gaggacattc aggcaagcaa gcacccaggt gatgaggagc tgcatccacc 360
aactgtgagc gagccccgag ctccgcagcc ctggccgaca gcctgactgc agccccagga 420
gacgctctgc gccagaatcc accagctgag ctgctcccag accctgactc gtaggaactg 480
tgagatcatc aatgtttgtt ggttaaagct gctaagtttt ggggtcactt gtgacacagc 540
aacagataat attcttccct aataga 566

<210> 265
<211> 334
<212> DNA
<213> Homo sapiens

<400> 265
ggccgacaag ggagataaat tccgtaatgg gagctgcggc cctgctctcc tgtcctggtg 60
gagctttggc tgatggaaag gattcagttg cctgtctgaa cagtgactac catgaactct 120
acatgctgtc tacttctaac cctctttggc ctgactccag cttcaacacc tggaaacatg 180
gcaaaaagaa caggggacaa ttggcttgga ctggagccac gtgtcagagt ttgactcaag 240

gatagttgat gtagaatgaa gagaatgagc agggaacaag aggtataaat gtgcatgatg 300
tttattcatt caacaaacat catttgagcc cctg 334

<210> 266
<211> 338
<212> DNA
<213> Homo sapiens

<400> 266
tcctgtttga gttnatntga gggccaggaa gggaaggaca aacctcccta ttaaagaaat 60
ccctggactg gaaaggactg gaacattggg agtggaagtc cacattagcg gaatagtatg 120
ttctgaaggc atttgagcag atgaaaacct gatacatgag acataaaacc tgaggaaaat 180
tatttcatgg gaacggtaaa aatggtggag agggtaaatt gggcaaggga gaagaacgga 240
ggagagggag agggaagtgc tgctgaactt atttcaaaga agaagaagaa aaaaaatgat 300
ctcttgtttt tcattaaata atggatgctc tccaggcc 338

<210> 267
<211> 432
<212> DNA
<213> Homo sapiens

<400> 267
cctactcagt tagaagatga caaggatgaa gacctttatg atgatccact tctactcaat 60
gaatagagaa atcagcaaag gacggtgtgc aggccagctc ccttctcaag ccatgtggtt 120
ggcagaccct gtgggagcct tccgggaccc acccttccat cctctgcaca gccgctaaag 180
gagggtgagg agcccacacc agaactggtc tgcttgtgag atgcctgaag aggacagtcc 240
cagttgattg tgttttctta actgtagact ctaatctctc caggtggaat cttaattgag 300
gctggccctg ccagggcatg tacagggtcc tgggaattca acagaatgaa ttcaacagaa 360
tgcatgggat ctgatgtcag aaatgccttg cttgtattct gaccatatca catatgagct 420
atgtggtgat tt 432

<210> 268
<211> 255
<212> DNA
<213> Homo sapiens

<400> 268
gctggagtgc acaatcacag ctctctgcaa cctcgacctc ctgggctcaa gcgatcctac 60
cacctcagtc tcccaagtag ctgggactac aagtgtacat caccatgcct ggctaattga 120
ttgtcaattt ttgtagagat ggggtatcac catgctgccc aggctgccaa gtctttatgt 180
actttccgac tcatcaaaag actaaattat gttcaatact attttagcat taattaaaca 240
tattttgcta tattg 255

<210> 269
<211> 428
<212> DNA
<213> Homo sapiens

<400> 269
gacggactct tgctgtgtca cctangctgg agtgcagtgg gcgcaatctc agctcactgc 60
aacctctgcc tcccgggttc aagtgattct cctgcctcag cctcctgact agttgggact 120
acaggcacat gccaccatgc ccagctaagt tttgtatttt tagtagagat ggcgtttcgc 180
catattggac agactcctga ccttatgatc tgccctcctc ggcctcccaa agtgctggga 240
ttacaggcgt aagccactgt gcccggccat gcattcattt cttacacgta tcattgttgt 300
tttaaaagtg aaaagcctaa gaagagatgt taggtttgct tgttagggta ggattaattt 360
ctaggtacac caagccaaat ttncagtcct gctgntaaca cccaacttct tgngaaccct 420
tttttttt 428

<210> 270
<211> 286
<212> DNA
<213> Homo sapiens

<400> 270
gttggagtgt agttgcgtga tcacagctca ctgcagcttc aatccccggc tccagtgatt 60
ctcccacctc agcccccgag tagctgggcc tacaggtgca cattacaaca cccagctagt 120
ttctgcagtt tttgtggaga gatcgtttca ccatgttgcc caggcatttc tcaaactcct 180
gtactcaagc aaaccttcca ctttggcccc aagtactggg attcaggcaa gagccaccgc 240
gtctagccaa ttatacaatt tttaaaataa attgaaatgg tcgttg 286

<210> 271
<211> 285
<212> DNA
<213> Homo sapiens

<400> 271
gtcctgatat ggaagaaact actgatgtca gctgaaggac cacactgatg cagctgtcct 60
gaaggactcc ccgaggagct acctcatcaa aaaatacagt ttccactttg cgatgatttt 120
atcccccttg ccccaaccga ccagcaaccc cagtattcca gcccctcact ctccacaata 180
cccttaaaaa ccctcatccc agaactcctt gaggagatgg atttgagggt cccttctgtc 240
tccttgcttg gccacccctc aatcattaaa ctctttttct gctgc 285

<210> 272
<211> 326
<212> DNA
<213> Homo sapiens

<400> 272
gctgtggtac cagtggtatg aagaagcaac taagagaacc caatggatga gttcctctgt 60
ttcagtaaat aatcaaaggc aacatctgag ctggataatg aacaggaaga aaagaccacc 120
aagtatcatc attagtggaa tactgactga aatgaatcaa gatctcttcc tcaaccaaca 180
tgacagaaac attccaaagc tgccttcatc aacctaggtt ctataagaaa ttaaagtcct 240
aatgctctaa tatatgctat tataggcaat gagctcttaa tcctatgcat ctagaagact 300
ggctatgtat cacccttggg agaact 326

<210> 273
<211> 362
<212> DNA
<213> Homo sapiens

<400> 273
tctccaaaat actaggtgta tggtgttatc tttccaccac tggtgaaaac aacccatggt 60
ctaggcactt tggagtagca cccaccagct gtgtgaaggt caaatggatc ttaaagagtt 120
gtgcagtggg actgaaagag gagagtcact atttcagaga taaccaaatg ttaaaaaaaa 180
gagttttgaa aacgtggaca agcttcaaat gaaaagaaga ggatgacaga ggacttggag 240
gggaagaaaa caaaaatcat aatcatagac aatattgttc accatgtaca agacagtgtt 300
ctaagcagaa tgagtgcctt tggtgatgat acctcgtcag gaccacagta aacttaccca 360
ct 362

<210> 274
<211> 105
<212> DNA
<213> Homo sapiens

<400> 274
ggaggctgag gtgggaagat tgcttgagcc caggagtttg agaccagcct gagtcaacac 60
agcaagacac tgtctcttaa aaaaaataaa taaatacttg ttttg 105

<210> 275
<211> 548
<212> DNA
<213> Homo sapiens

<400> 275
acagggtctt gctctattgc ccaggctgga gtgcagtggc acaatctcag ctcattgcag 60

cctcgacctc ccaggctgag atgatcctcc cgcctcagcc tcctgagtag ctgggactac 120
aggcgcgcac caccatgcct gctgattttt tgtagagaca gagtctcgcc gtgctgcaca 180
gactagtctc gaactcctga agctcaagtc atctgcccac ctcagcctcc caaagtgctg 240
ggatttcagg tgtgagccac catgcccagc catattcttt tttttttttc aatngnnggg 300
aaattcccnt ancataaaat taacttttta aacngaacaa ttcagggggg ntaaaaanat 360
tnanaagggn ggactannan aaccttngnt tagttccaaa anatttttnt tacccccnca 420
aaaagcccan acnttggang nnggaacttc ccntttttcc cctnntccca gccnttgaaa 480
acnacnaann tggtttttgg tggntngnct nttttggnnn tttnanataa anggnggttt 540
ttaatatg 548

<210> 276
<211> 358
<212> DNA
<213> Homo sapiens

<400> 276
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gagagaattc tggatgatcc aggtgggccc ttaataatgg tcccttatta cagagagcca 120
gagggagatt tgaaactgac aggagaagtc agtaagacca tgaatgcaga gattcgagta 180
atacggctac gagccaaaag atgccagcag ccacctgcag ctggaagagg cataaatgga 240
ttctccccta aagctcccag gagtgtggcc ctgctgacac cctgatttca gccccatgat 300
actgatgttg gactggtcct cagaactgtg aaagaataaa ttcctattgt tttaaacc 358

<210> 277
<211> 183
<212> DNA
<213> Homo sapiens

<400> 277
aagngattgg aggtgagtca gcttcaaccg tgccatgagg acctcaccct aggaggtggc 60
agagacaccg gaggaatgga acccaagtca tggaataacc tcacattgca gagccacctt 120
gctaatcttg gactgctcac ctctggacta tcactggaga aataaataca cttttaagtt 180
gtt 183

<210> 278
<211> 381
<212> DNA
<213> Homo sapiens

<400> 278
ggggagctcc tgcttaagtt acgaagctgn nattcattct ntagaagggc atcanaggaa 60
gataaagaag gatcctcaat gtcagacatc tgagcccaag ctaagccatc ataatccctg 120
tgacgtgcac atatacatgc cccactccaa ctaatcaatc gaccttgtga cattcctccc 180
ctggacaatg agtctcatga tctcccaacc ctgcaccttg tgacccctcc cctgcccaca 240
agagataacc acctttaagt gtaattttcc actacctacc caaatcctat aaagctgccc 300
cacccctatc tccctttgct gactctttgt ggactcagcc cacttgcacc caagtgaaat 360
aaacagcctt gttgctctca c 381

<210> 279
<211> 459
<212> DNA
<213> Homo sapiens

<400> 279
gtcgaactgt gaccctgnnc tcccttgctt tantggaatt ctcttccagc ttcttggacc 60
ctgtactggg gtgaagagta tcttccaaaa attcacatct acccagaaca tcanaatatg 120
aacttttttt gaaatacgtt tttgcngatg taatcanata aaaatgagat nataccanat 180
tagggtnggc ccttatccaa tgaatagtat ccttacaaaa agacggaaac ttggacatgc 240
acattccggg ggaacctcca tgtgatggtg aacactaaga ctggagtgat gtgtctacaa 300
gccaagaaat gccaagattt ccagcaggca ccagaagcta gtagagaggc atggaacaga 360
ttgtccctcc gaacctccag aaggaaccaa gcctgcagat gccttaattt cagacttctg 420
atgttcagaa ctacaaaaga ataaattcct gttgctttt 459

<210> 280
<211> 281
<212> DNA
<213> Homo sapiens

<400> 280
tggggagctc ctgctttaag ttagaactnt gggacagnat gtcngtcnna canttttatc 60
ccggntggaa tgcagtggtg tgatcctcct gcctcagcct cctaagtagc tgggactaca 120
gagacggggt ttcaccatgt tgaccaggct ggtctagaac tcctgacctc aagcaatcca 180
cccacctcgg cctcccaaag tgctaggatt acaggcgtga gccacctcgt ctggccaata 240
aacagaactt acaattgatc tnaaaaaaaa aaaggccggc g 281

<210> 281
<211> 252
<212> DNA
<213> Homo sapiens

<400> 281
gaagatgagg atactgacag agtaaaatca tggagaaaat ggaagaactg aatgcagaca 60
tgagaagtta aatcacagaa gaaaagttaa gcaggaactt gagagaggga tgaactgtga 120
caagttgtaa gaaggaagac caggactcac caggaaaata ataaattgtc cttgatcgta 180
caaaagaatg tgttaatgga attttcctaa taaatgtgag agaatgtcag cataaatatt 240
gattttaaaa ac 252

<210> 282
<211> 380
<212> DNA
<213> Homo sapiens

<400> 282
atggagtctt gctctgttgc ccaggctgga gtgcagtggc acaatcttgg ctcactgcaa 60
gctccgcctc ccaggttcat gtcattctcc tgcctcagcc tcccaagtag cggggactac 120
aagcacccgc caccacgccc ggctaatttt tgtactttta gtagagacag ggtttcactg 180
cgttaaccag atggtctcga tctcctgaac ttgtgattcg cccacctcag cctcccaaag 240
tgctgggatt acaggcgtga gccactgcat ccggcccagt aatcttttaa accacactca 300
ttgnctaatt ttgctagcaa ttcaatataa actttatgct ttgaaaataa aattggattc 360
atttgaaga cttaaaaaag 380

<210> 283
<211> 120
<212> DNA
<213> Homo sapiens

<400> 283
gtcatctttg atctatcaga ttttaaggca tcatctgaca gcagatcttc aataagtatc 60
tgtggcatga aggaaaaggg aaaggaaaag ggaaaggaaa aaggaaagga agaaaggaag 120

<210> 284
<211> 317
<212> DNA
<213> Homo sapiens

<400> 284
gttcatgtgg aaccctgggt tctcctacat accatttgga gacgctgggg accagtatta 60
aagaaaaatt atccagacac ttgtaaaaat gcacagtgat ggacattgag gaagatattg 120
tatatttgtt cactcaacac tcattccaac gctctcctag tttgcctttc tatctactac 180
aggctggaag actgactcta gtggagcctg ctgtctgaaa ctccgaagtc tgaccaaagc 240
agcaaccccc tctccattat ccctgttccc cctcctctca cgacataaac aaaagtgtaa 300
gcatggaaat cataatt 317

<210> 285
<211> 300

<212> DNA
<213> Homo sapiens

<400> 285
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atgtaaagag ccatgaaaca gatgtgagag atgccctgac ttagaagccc cctcttcaca      60
ggtgccaaca tctcttgaac aactcagcag gcatggtttc aaagaccccc ccacacaaaa     120
tgcccgatta tgagtcaaca ccttccagga agcccaaagc attttcctta tctggagatc     180
ctctgtcagt caaattccac tattatgaat acagcaaaac aatacagaag aaatgagacc     240
attatgtaac agaaatagat gtcacagaga tcacacaata aagctcacgc aatttactcc     300
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<210> 286
<211> 436
<212> DNA
<213> Homo sapiens

<400> 286
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ctctgttgcc caggttggag tgcagtggtg caatctcggc tcactacaac ttctgcctcc      60
caggtccaag ctattctcct gcctcagctt cctgagtagc tgggattaca cgcacacacc     120
accatgcttg gccaattttt gtattttaaa agaggtgggg ttttatcaca ttggccaggc     180
tggtctcaaa ctcctgacct caagtgatcc acctgcctcg ccctcccaaa gtgctgggat     240
tacaggtgtg agccaccggg cctggccaag agttacttac atttttaaat gacacattat     300
ggcattttat gggagaaatt cttctgctgt cggcaatatt cgatttgagg atttgaccag     360
gtctctggac atctccacac gtgtcaatgg gctaaggtgc tttaaataaa caaggttatc     420
tgcataagtc cacaat                                                     436
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<210> 287
<211> 388
<212> DNA
<213> Homo sapiens

<400> 287
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attggcgtgc ttaaagggct gaccatctga tgtacaggaa atggaaacta ctctctgaaa      60
agcaagtgat ctcccagccg cacccattta ggagaccagg attttatttt gatccacagg     120
agactaaatg agttagaggc cactcctgta tcaacagagt ttgttactta aatgacagta     180
gggcggttcg cagaaggaac accaaatagt ctgactatct accaagaaga gagtgtttga     240
acacatgtgc aacctcttga ctgtggtgtg tggggcagca tttaataaga aagagctaaa     300
tctgcttgat gtgggaatat attcaacaca tgttaagtgc taaaatattc aaagtaaata     360
aatgtctatg tactccatat tgttaaag                                         388
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<210> 288
<211> 324
<212> DNA
<213> Homo sapiens

<400> 288
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cggctgaatc acttgagctc aggagttcaa gaccggcctg gccaacatgg cgaaaaccca      60
tctctacaaa aaatacaaaa attagctgca cgtgatggtg cacacctatg gtccccgcta     120
cttgggaggc tgaagtggaa ggattgcttg agcttgggag gcggaggttg cagtgagcca     180
agatcatgcc actgcacgcc agcctgggtg acagaggcag accctgtctc taaacaacaa     240
aaaaccccac tgaattgtat acgttaaaag gactttacat cacgtgaatt acatctcaat     300
gaaaaataaa atactgaatg aacg                                             324
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<210> 289
<211> 565
<212> DNA
<213> Homo sapiens

<400> 289
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gtggaaagag aatagcttgt gagagtgtat gagtggaatg aagtggtcag atgagagagc      60
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<212> DNA
<213> Homo sapiens

<400> 290
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tttgcttaag taaagtcttc aaaataaata ctgattttaa tga 343

<210> 291
<211> 403
<212> DNA
<213> Homo sapiens

<400> 291
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<210> 292
<211> 185
<212> DNA
<213> Homo sapiens

<400> 292
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gctgtgtctc cattcctgag ccacagaaac tatgagatga taaatgttta ttgctctaag 180
ttgct 185

<210> 293
<211> 231
<212> DNA
<213> Homo sapiens

<400> 293
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ggaattatag gcgtgagcta ctgtacccgg ccactgttgc tgttttgaaa gggagccctc 180
ctctccccta ccacattcta tattaagaaa ttccaaatta aatgaagaga t 231

<210> 294
<211> 153
<212> DNA
<213> Homo sapiens

<400> 294

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ctatgaaaaa taaatttctt ttgtttataa atc 153

<210> 295
<211> 289
<212> DNA
<213> Homo sapiens

<400> 295
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caatgttcta ctttaattgg gcacttacaa agtaattctt caatcagtgt ctctaatgtc 120
tcactgcttc ccaacaaatc tacgaagaca gaacaaaaga tgcaacttac agaaacacag 180
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cactgaatag cagaataatg gaagattatg ataaaaataa ttaatggtc 289

<210> 296
<211> 275
<212> DNA
<213> Homo sapiens

<400> 296
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tntncagaag tgtaagaatc aaatttntga tgtgtataag ccatgcagnc tatgatactt 180
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tnntcatctg taaaataaaa agtttgaaaa caagg 275

<210> 297
<211> 292
<212> DNA
<213> Homo sapiens

<400> 297
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cagacaccca ccaccacacc ttgactaatt tttttatctt tattttttgt aaccggtctc 180
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atgagccact gcgcccaatc tagaccctaa taatgaataa aacattaaaa tt 292

<210> 298
<211> 577
<212> DNA
<213> Homo sapiens

<400> 298
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gcctcaacct ctcacaatgc tgggatcgca ggtatgaaca accacaccca acccnggtan 420
gggtattatt atcatcatca acaatggtat tctttggttc tcttaaccaa actgaatgcc 480
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<210> 299
<211> 148
<212> DNA
<213> Homo sapiens

<400> 299
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ctatgaaaaa taaatttctt ttgtttac 148

<210> 300
<211> 338
<212> DNA
<213> Homo sapiens

<400> 300
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gctccccgtt aagatgggtc caatagctac cactgcattt acctcgaagg agtaaatgag 180
gattaactaa gcgcctgatg tgaagaactg tgcctgcagc ctttgaagga agccaggctt 240
tcgaggatgt gtgaggcctg gggaattcat ttgtttcaaa taaccatcaa tgagattcca 300
gatttcctgc ccagagttaa aatcggtgtt gaaaaccc 338

<210> 301
<211> 334
<212> DNA
<213> Homo sapiens

<400> 301
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tggagatcct cactgnctca ngggcnnagc tggtttgaac acggtctttc cattgnttna 180
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atgaccctgg agaatgaata gccatgngtg gcagtataag tgcttggaag gtgacttagc 300
ccatttgaac aataaaactg tcttttaaac aggt 334

<210> 302
<211> 448
<212> DNA
<213> Homo sapiens

<400> 302
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caatcctgga aggatacana catgttcatg angcttcngg cgcatatgtg acanaacttt 180
ccatgaaacc aactggccat gantcnaagg actccttcac agagacaaat ccatctcctt 240
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cctaaaggga ttttaaaaaa tcccaccatt gctttatcac aacttggggg attattantg 360
gatttccctc cctcttgctc ccanaaggng gactttggag aaaaagagag tttgggagct 420
aagaataaac cgcatttctt gcatatgt 448

<210> 303
<211> 216
<212> DNA
<213> Homo sapiens

<400> 303
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cgcctgcctt ggcctctcaa agtgctggga ttacaggcgt gagccaccgt gcctggccct 120
agcaagtcac ataatttata gagggtaact ctgtcgattt taaacttcgc gtagtctgac 180
ccattcattc atccaataaa cacgtattca gcacct 216

<210> 304
<211> 260
<212> DNA
<213> Homo sapiens

<400> 304
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aatggaattg gctggcatct taagtttgga cttcccagcc ttcaaagctg tgagaaaata 120
aatgttgttt aagcccttgg ngaaaaagac aaannaaact gcttttcaaa aaactnanna 180
anaanttgga cggngncggg ggncncctnt gtgnnctttc nacacnncgg gnnttttttt 240
naaangggggg gggccccccc 260

<210> 305
<211> 520
<212> DNA
<213> Homo sapiens

<400> 305
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gactgtagtc tgtttaactg agacctcaca cataatgtca tggttgacag ttactggttg 120
aaggaaatcc atgttgggct tctgtggatg ctggattctt tccttctgag aagaaatata 180
acacactgac tttgaggtga tggtggagaa aaagtacaag cagaagactt ttcncaactt 240
ctccataggc tggagtgcag ttgcatgaac atggctcaca gcagcctcaa cttcctgggc 300
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gaaaagacat acagacttca tctgatggtn acaggttaat ttttacatgc atggaggcct 480
tcatagaaaa agaagtgaan gccctaaaga agtgatttta 520

<210> 306
<211> 393
<212> DNA
<213> Homo sapiens

<400> 306
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cccagatcac ccctcgtgga ccccccacaa ccactgaact attctccaca gctacacttt 180
tgccatttca agaatgttat gtaaatggaa tcatacagta accttttgga attggctttt 240
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ggtgcggacg tacaatttaa cgtttcaccc accaaaagac attggggttc tttccagttt 360
ttgactgcga caaataaacg aatataaaca ttc 393

<210> 307
<211> 304
<212> DNA
<213> Homo sapiens

<400> 307
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tcctccgttt gctagttgtg tgactaaggg cagtttctta actactctgt gcctcctctg 240
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attg 304

<210> 308
<211> 365
<212> DNA
<213> Homo sapiens

<400> 308
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ttgcttcaaa attattggtg agccctgtgc taatttccat ctcatcctag aagtcagtta 180
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aagac 365

<210> 309
<211> 298
<212> DNA
<213> Homo sapiens

<400> 309
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tgaaaccccg tctttaccaa aaatacaaaa aaattaacca ggcgtggtgg cgggcgccta 180
tagtcccacc tactggggaa gcttaggcag gaaaattgct tgaacctggg aggcagaaat 240
tacactgcct gagattgcat nactgcctnc acctgggcaa caagacaaga ctccgtct 298

<210> 310
<211> 459
<212> DNA
<213> Homo sapiens

<400> 310
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ggacttaacc aggctgaact tgctcaaaag gggggggg 459

<210> 311
<211> 585
<212> DNA
<213> Homo sapiens

<400> 311
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ctcttgcccc atttgggggga tgncattgna atcatgccaa gggccctgac gtcanaactt 540
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<210> 312
<211> 117
<212> DNA
<213> Homo sapiens

<400> 312
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acacgccgaa attcatcctg cactccagcc tgggcaacaa gagcgaaact ctgtctc 117

<210> 313
<211> 132
<212> DNA
<213> Homo sapiens

<400> 313
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gatttcctag ccttaagtga tccccccacc ttggccttcc aaagcattgg gattacaagc 120
atgagccact gc 132

<210> 314
<211> 263
<212> DNA
<213> Homo sapiens

<400> 314
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agaagacacc tgctctccct tcacctccca ccatgattgt aagcttcctg aggcctcact 180
ggaagaagct aagaagatgt tggcgccatg cttgtatagt ctgaagaacc atgagacaat 240
taaacctctt ttctttataa att 263

<210> 315
<211> 362
<212> DNA
<213> Homo sapiens

<400> 315
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gggggcaccc acctccagca aacacgccac aagcaccttg gaaaattcaa ttctgcctcc 360
ct 362

<210> 316
<211> 141
<212> DNA
<213> Homo sapiens

<400> 316
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ttgtaggaag gaacgcacta aggaataact agaaacggat gaagaagatg atacagagcc 120
acgctgcagg actattttga t 141

<210> 317
<211> 508
<212> DNA
<213> Homo sapiens

<400> 317
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tcaagtgatt cttctgcctc agcctcccga gtagctggga ctacaggtgt caggcctctg 120
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taagtgaaga tccacaaaag aagtgaaaat agccttaact gatggcattc caccattgtg 240
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caccctttgc tgactctttt tcggactcan ccgcctgncc ccgggtaaaa taaaaagccn 480
tgtgtcacgc caaaaaaaaa aagggccg 508

<210> 318
<211> 404
<212> DNA
<213> Homo sapiens

<400> 318
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tgaggaccca ccgtggagtt ggaacctgac ttgtcgggcg ctgaggacct gccaagtgag 120
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aggtgccatg cgtgccatac ggtgcgccac gtgaagtgca ccgtaaacat gatttaattc 240
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<210> 319
<211> 237
<212> DNA
<213> Homo sapiens

<400> 319
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tctctgtaga acagctgaag cgaccgcatg gcctcaactt ctccttccac ccattcctgt 180
ttcctgccct ccctgctcag ggtaactcc aagagcaccc tccagtaaac ctcttgc 237

<210> 320
<211> 218
<212> DNA
<213> Homo sapiens

<400> 320
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gtcccaactc agactccaag agagagtttt tggacctcaa gcgagaaaga tttcagagca 120
agtccacaga gtaaagtgaa ggttctaaaa cactatattt tgggagtgca gcaagggttg 180
gcggaatgga actgaaataa caagtgggtt tgttatcc 218

<210> 321
<211> 226
<212> DNA
<213> Homo sapiens

<400> 321
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aaaggacagc tcttagagag ataggataat tactggactc aagaagatac caaatcatgg 120
tgtgcatttc tgcgttgtgt ttggaagagg aactaggatt gttatgaaaa ggaaggatgt 180
gttcaactta naagaattaa acctcaacca tctgtctctt cccaac 226

<210> 322
<211> 177
<212> DNA
<213> Homo sapiens

<400> 322
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cagataagct gttttaaaat attatcttta tttgtatgct catatcagga taactccaac 120
taaggcaatt tgtctaagta gctcatttat ttaaaaagaa aagtaaaaat agcaatg 177

<210> 323
<211> 502
<212> DNA
<213> Homo sapiens

<400> 323
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aggttttttt gtccttgaag agcacttagg gctggagagc aggacacatg ctgacgagca 120
gaagctgaca ggcttgctgc catgtgggaa agtccttgga cgagttgtct gcttgcggag 180
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tcagccagcc tgcaatggac ttgtggggtt agcaataagc ttttgttggt ataagccact 420
gagagccagg ggctgtatgt tactgnggca gaacttaact gaagctgact aacactggta 480
ctaacagaat cattttcaaa tg 502

<210> 324
<211> 229
<212> DNA
<213> Homo sapiens

<400> 324
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ggccccacta cattcttaaa gaagcaataa attgaccttg tttaaatac 229

<210> 325
<211> 297
<212> DNA
<213> Homo sapiens

<400> 325
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ctctcaccct cttgccttcc actatggggt gatacaagaa tgccctcgac agatgctagc 240
actttgatac tggatttccc accctccaaa gctgaaaaat aaatttcttt cctttat 297

<210> 326
<211> 282
<212> DNA
<213> Homo sapiens

<400> 326
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cacacaagga gagatccctg gtaattaccc ttgacagcca gtgtgaaaag ggcccgggat 180
gggggctttg tccctcccct ctccgctcac acctctcagc cgcagtaggt tctttcctgt 240
tgctcctgtc ttgatttaga ataagctcct tttctctaaa gc 282

<210> 327
<211> 269
<212> DNA
<213> Homo sapiens

<400> 327
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aaccactttc acctcgtaaa cagcagctgg tgagaggaat ggacttgcac attcattcgt 120
tttacaaatg aagaaactga agcacagaga aggaaggaat gatttgtgca ggaggtggta 180
tttgagatac tcatcatttt ctctcattac ccacatttgt ttctactcct gtagtagttt 240
ggttaaaggc aatagactcc ttgttcctt 269

<210> 328
<211> 174
<212> DNA
<213> Homo sapiens

<400> 328
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ccagacctcc ccgcggattg acacatcaat accgccaaag aaaatggcct ggaggaagcg 120
gcaaaagttg gtgaggggat naaatggggc agctcaaaga acccccaaat cccc 174

<210> 329

<211> 405
<212> DNA
<213> Homo sapiens

<400> 329
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aaaaggaaga aagaagagag atcaaagtgg gagaaggaaa aataaaaaga aaaaggacta 180
agcactttct tctttcctct gagagactgc ggtggctctc ccacctttcc ggagactcgt 240
cagcacctgc ctggtggaca gcaccacatc tttaaattct aaggttctaa ccccctttatt 300
cccaaattct ggagttcact aacaaagtgg ttttcattct ttaaaaaatg aaatgaaacc 360
aaagagggac acacagaggg cttccaaaat aaaatgctag atctt 405

<210> 330
<211> 434
<212> DNA
<213> Homo sapiens

<400> 330
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ggcgaggatg tagagaaatt ggaacccgct gttggtggga acgcaaaatg gtacagccac 180
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gcagaaaaag caggaaagag gagatggtna gagacataaa tggggaattg ggggcaacag 420
gaaattctgg cccc 434

<210> 331
<211> 167
<212> DNA
<213> Homo sapiens

<400> 331
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tgcttcttgg gggctaagga agaaactgag actgcatttc atccttcagg agtgagaagt 120
ttttgctcca gtcataaata cttgctgaat aaatgaatct tctattt 167

<210> 332
<211> 254
<212> DNA
<213> Homo sapiens

<400> 332
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gcagagtctt cagatggatg gagggagctg cagtcactga accactgcag ggagagaagt 180
actcacagac caggaacgct caacttggac tgttatgtga cagagtaata ataaacttct 240
attttggttt gagt 254

<210> 333
<211> 422
<212> DNA
<213> Homo sapiens

<400> 333
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gttctgtctg ggaagaagca tcgatcccta aatggctgca tggagcagag cagagatgtc 120
tgctcactaa gttggttcga agctgaggag gaaaaaaatt aggtgctagg atgctggaga 180
gatcctcaga aacccctcta catgaatcat ttaagtagat gaagagctag attgcaataa 240
tcattgggag gagaagaaga ataaaacatg agattccatt cacatcccag aattaaaggt 300
aaaatgggta aaaagtgaca ttttcaaacc tggaatcaca ctggaacggt atttgcatct 360

tggtaggtaa caataaaaat ttaactntna aaatanggcc cngggggggg gggtcatgcc 420
cg 422

<210> 334
<211> 327
<212> DNA
<213> Homo sapiens

<400> 334
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tgaaaccctg gaagaatctg gagtcagcag aagtgtgcat gttgcaaaaa tcacagaatc 120
atgtaaggaa tgaaaggaaa gccccccttct tcaaccctga ctccaacaat cccactgctc 180
aaaggaaccc agataatacg taggaaatac atacctacgt gtttcttaca tatttagaaa 240
tatgtcaaca taagtcatta taaacataag tcattataat taagtcattt gtacttgaga 300
agtcctaatg tacatggtta caatgca 327

<210> 335
<211> 460
<212> DNA
<213> Homo sapiens

<400> 335
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gctttccagt gcagcccttg gaattaaaaa ggaaaattcc tgccctcaga taaagatagg 120
gtcttgctgt gttgcccagg ctggtcttgg actcctggca tcaagcaatt ctcccacctt 180
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ggagagaaat ctcaacagta tgggcatagc tggctccttt tattcctgct tttcatcgtc 360
tttggctaaa ctgccatgga gacctggccc cttctacctt attttagaca ctttaaaaaa 420
cacgggcncn ctttggntan anattttaaa aaaccccccac 460

<210> 336
<211> 305
<212> DNA
<213> Homo sapiens

<400> 336
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actcctatct gcctggaatg ctgttgtgtg anggtgtaat gtttgaagct gtggctgcca 120
tcttgtgaca aaggggcact ccgtgttgtc aggatgagga cggcagagga agatgctggg 180
gaaagcctgg atctgcggac atctctgaac cactacgtcc tgggaccagc tatctgggct 240
tcctgttttg tgagataatt tcacgtattt atgataaaat tattaaaatt tgggtatcct 300
gttat 305

<210> 337
<211> 174
<212> DNA
<213> Homo sapiens

<400> 337
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ttccatgaac tttttgaaat ccccttgtat tggcttcctt ccctcttctg tcttacttct 120
ctactcccta caagtgtttt ctgggatcac ctccaaataa actacttgca atct 174

<210> 338
<211> 98
<212> DNA
<213> Homo sapiens

<400> 338
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tacaaanatn tgcctgcttt ccagngcagc ccttggaa 98

<210> 339
<211> 291
<212> DNA
<213> Homo sapiens

<400> 339
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aaacagaact ccagatttaa aaataaagga ctgtatttcc cagcatccct tgcagctagg      60
tgtgggcatg caactaagtt caggctaatt tcttcctgaa agcatacaaa gaacctacaa     120
ctgaggcctc ctgggaatat accaaggcac catccacccc ggggcctttg tacttgctgt     180
tccctttgcc tggaagactc tttctccaga tatctgcagg gccccaccct caattcattc     240
ctgtattagt ctgttctcac actgctaata aagatatacc agagactggg t              291
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<210> 340
<211> 271
<212> DNA
<213> Homo sapiens

<400> 340
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aaagntgang ccaggcgtgg ngnctcacac ctgnnattcc ancactttga gaggccanga     120
tgggaggact gcttgaggcc agaagtttga gagcagcctg gtcaacatag ncagacctca     180
tctctaaaaa taaaaataaa gtanataaaa cataaaaaaa gaagaaacnn cnaanaaaaa     240
angggcctcn gnggccnttt aacttgggat t                                    271
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<210> 341
<211> 285
<212> DNA
<213> Homo sapiens

<400> 341
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tggggagatg tctgcgtnct nctncttgag gagaanccgg gataaatgga cttgangcca      60
cgaggagcca gtgagtggtg cctggaacac cgtatgatgc ccagaggagc ccagcagtca     120
tgctctgaca gcagcatatg gtgcgcactg gaagaagggg aaaataaggt caggaaggca     180
gactgggagc ttggattcga ggctgaagaa ctgccatcaa atgtttttga aaggtgtgaa     240
ataatcaaaa ctgtactcca tgatgattaa agctggcata gtgtg                     285
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<210> 342
<211> 400
<212> DNA
<213> Homo sapiens

<400> 342
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acctctgctt cctgggttcg agtgattctc ctgcctcagc ctcccaagta gctgggatta     120
caggcatgtg ccaccaagcc cagctaattt ttgtattttt agtagagatg gggtttctcc     180
atgttgttca ggctggtctc caactctcga cctcaggtga tctgcctgcc tcggcttccc     240
aaagtgctgg gattacagat gtgagccact gcacctggcc aaaagtgaag tcttaattcc     300
taattacttt gtctcctctt gttattaact tcttttcact tcttgaattt actgnactaa     360
ctgcaccaaa agaaaaattt cttgattata taattcatgc                           400
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<210> 343
<211> 459
<212> DNA
<213> Homo sapiens

<400> 343
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gttaatgctg ggntgaggcc ctggggcctt ggttngtctc cacattgncc tctccattan     180
gcctggactt cctcacanaa tggtggacga gnctctaagg gtaaacatcg caagagagaa     240
aaccanacaa gagagcaaaa cttgcctttt gtgacctagc ctcagaaatc acatagtgtc     300
tattaattga agcaagtccc aaagtcccac ctgggttcaa ggggaggaga tactgactac     360
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actgtccttg atgggagggt ggtaaagatt ctggaagaaa aatgggacca naaatgntgn      420
tgcaccnttt tggggaaagg gaatntaacc caaccgggt                             459

      &lt;210&gt; 344
      &lt;211&gt; 423
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 344
attcattctc atagaagggc atcagaggaa gataaagaag gatcctcaat gtcagacatc       60
tgagcccaag ctaagccatc ataatccctg tgacgtgcac atatacatgc cccactccaa      120
ctaatcaatc gaccttgtga cattcctccc ctggacaatg aatctcatga tctcccaacc      180
ctgcaccttg tgacccctcc cctgcccaca agagataacc acctttaagt gtaattttcc      240
actacctacc caaatcctat aaagctgccc caccccctatc tccctttgct gactctttgt     300
ggactcagcc cacttgcacc caagtgaaat aaacaagcct tgttgctccc aaaaaaaaaa      360
aggccagngn ggccaattna gcttggactt aaccaggctg aacttgntna aaaggggggg      420
act                                                                    423

      &lt;210&gt; 345
      &lt;211&gt; 238
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 345
tttcagagag gaggggagct gtgcagagat gtgctggagg agtgcctatt ggtgaccaaa       60
gacatgggat gctgaagcga tacagaatgc cacctggaag ttcgttgaaa ccattgccga      120
ctaggtgtgg tggcttcgtg cctgtaatcc cagtactttg ggaggctgaa gcaggaggat      180
cactggagac caggagttca agaccagccc gggcaacata gtaagaccct gtctctac        238

      &lt;210&gt; 346
      &lt;211&gt; 151
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 346
aaaaaggtaa tatttaagcc tgaagtttaa actttctttg agatccactc tgaagattta       60
ttaatttctt ggggtttgtg ctgcattctg cccctggctc ccaccatgta tccatgaggc      120
atgcatgtta acaaacttct gtttgatttt c                                     151

      &lt;210&gt; 347
      &lt;211&gt; 423
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 347
gtggccatta gggtggtcca gaaggctggg gaagcacaga caagggtaac tgcaaaccga       60
cagcacaatg ggatacctca gnatcccgcc aggatggctg taactcaaac gacagcaaca      120
ccaatgcagt agacatgagg tttcatcacg ttggccaggc tggtctcgaa ctcctgacct      180
caagtcatct gcctgcctcg gcctcccaaa gtgctggaat tacaggcgtg agccaccgca      240
cccggcctgt ttctaccatt ctggaaaaca gtttggcact atactaaatg cctcagcagt      300
ttcacttttg gaaccttctt tgccctcacc cctgggaaat aacatttgcc aaaactcatt      360
gaactgtact cttaaaatgn ggacatttta ttatatgtna actataattc aataaaattg      420
gtt                                                                    423

      &lt;210&gt; 348
      &lt;211&gt; 456
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 348
gattatggat tatggatctc tggaataaaa acatttagtg tcacagcaaa agaagttttg       60
agtttatata caaattaagt aaaagactaa ttttggtttt gaaaaactcg ttctctaaac      120
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ttttacagga agtttaaata aattacatca tgaacaaaac tgcagtatgc cagttcctat 180
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aaaaaaccta accttatatg taaatgtatc tagtgngcaa atgacataat gcttatatgn 360
atggaaatct atctagnggg ccaatgactt aatggccngg gnggggaaac ngngggcgag 420
aagcccccaa ttccncccctc cnggttttgg aaaaac 456

<210> 349
<211> 249
<212> DNA
<213> Homo sapiens

<400> 349
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aagagatgct ggaccttctg cagtaatgag aaatgaaagt caccactctg ctctaaaagc 180
aggggctatt tacccctgac ctgacacact tctcaaagct ctcacaataa aggcacccag 240
catccactt 249

<210> 350
<211> 205
<212> DNA
<213> Homo sapiens

<400> 350
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tcattttgca taaagggaaa taggcccaga gaaagaaaag ggactgtccc aagatcgcac 120
agcaaccatt ttgaccttca acaagtactc cctgactcca agcaataagg gtgaaaaaat 180
aaggaataaa ttgtataaag cacgt 205

<210> 351
<211> 458
<212> DNA
<213> Homo sapiens

<400> 351
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gacacccacc tggagaagcc ntggnattcc atgganaggc agacggaccc agctgagctc 180
agtgttccag ccatccccac gaaagcacca ggaacctgag tgaaaccatc tcgatcctcc 240
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cactgaagga tcaccсntnt gaaccctgcn caaatttctg actcacaaaa ctgtnganca 360
tacaatggtt ggtggttagg gggcagtttg gtatnctntt ncaattaatt tgccggaaga 420
gnccccaann aaaaaaataa gggggcccg gcaagggc 458

<210> 352
<211> 285
<212> DNA
<213> Homo sapiens

<400> 352
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tggctccttc agggcctgac agggtggtga accccacgga aacatcaggg cagcctgggc 120
aagacaaagg cagcttcact ccacaactgt ccagaatcaa ggatccgggc cgggcgtggt 180
ggctcacgcc tgtaatccca gcactttgga aggccgaggc aggcagatca cgagatcggg 240
acaccgagac tatcctggct aacacggtga aaccccgtct ctact 285

<210> 353
<211> 448
<212> DNA
<213> Homo sapiens

<400> 353
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ggtactccaa gccttggggc caacaaga 448

<210> 354
<211> 360
<212> DNA
<213> Homo sapiens

<400> 354
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ggatcacctg agcccaggag ttggagacca ncctgggcaa canattgaga ccctgtctca 180
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acatagcgag acaccccccc catctcaaaa ataaataaat caaaataaaa aataaagagg 360

<210> 355
<211> 387
<212> DNA
<213> Homo sapiens

<400> 355
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cttaaaaata aaagttgaca aaaagaaaac ataaaaaaag ggccaggggg gccaatncnt 360
ttgnacttaa cctggctgaa cttgttc 387

<210> 356
<211> 418
<212> DNA
<213> Homo sapiens

<400> 356
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nggcaccnaa ggnctattcc tctaccctac tggnttatca ctgggctgaa gaancccaag 240
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tggaatnngg aatgagctcc tgggttactg aaagtctact ttggtgcctt gaatttaacc 360
caatcccata tgtgataatt attttagcat atttgataat aaaagaattt aagaaggg 418

<210> 357
<211> 363
<212> DNA
<213> Homo sapiens

<400> 357
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cctttaacag agactgtgca gctctgagcc caggactgtt aagcacttgg caggcaatgg 180
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cacattccat tttaggaaca gtataacttt cccagccaga aattgtctaa tttaaaccct 300

gactcttacc tgtgtgaatc aaaatgactc anaaagtgca aataaaataa ccctgaggag 360
tcc 363

<210> 358
<211> 332
<212> DNA
<213> Homo sapiens

<400> 358
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tgtattttct ctccccaaag gcagacttga gacccccagc ttcagggtgg cttctgcctg 180
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ggagaagaat ctgctggaca ctgcttgggg ctggaccctg agagcgctca catttgacac 300
cccagaaagc aaataaaaca gttgaaatat gt 332

<210> 359
<211> 394
<212> DNA
<213> Homo sapiens

<400> 359
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catgttcctt ctcatgctta cctttctttg cctgacgtga gtgcaaaaac ctatcttaag 360
caagataatt gtaaaaatac caaaattaaa tgat 394

<210> 360
<211> 373
<212> DNA
<213> Homo sapiens

<400> 360
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ataaccggtg tccttacaag aagagaagac aggacacgca cacaaagcaa gggtcagcca 180
tgtgaggaca gtgagaaggc ggccgtcgac acgccaagga gagaggcctg ggaagaaacc 240
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tgtttaagtc aaaaaaaaag gccagcgagg ccaattcagc ttggacttan ccangctgaa 360
cttgctcaaa agg 373

<210> 361
<211> 431
<212> DNA
<213> Homo sapiens

<400> 361
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cgacaagcat caaacccatc tcttctcctt gctctggcca ggtcagactg gagccaactg 180
tgctgcagct cctgtggaag ccttggcagg gaggtgaggg ggagcaccag ttacaagcaa 240
aggctccgag tgcaaagagc cttcgcttat gattcaggaa tctctgggca agttacctaa 300
ggtatctgag ccagcagttc gtcatctgtg gaatggggag aatggcaaca cttctcataa 360
gggttgaagt aagggaataa aatgatataa tgngnattaa acccttaaaa aaagggctgg 420
ctggcatata a 431

<210> 362
<211> 253
<212> DNA

<213> Homo sapiens

<400> 362
gtatttttca gaccctgcat tctgttggat ctgctgatgc cacccagact gataaactgg 60
ttcatctgac cttgtggccc cccgacccag gaactgaact cagcacaaga agacaggctt 120
caactccctg tgatttcatc cacgacctaa ccaatcagta ctctccactc cctagcccca 180
ctgctcccca aattatcctt taaattttgg gggaggctgc tttgaataat gataaactcc 240
tgtccttctg ctt 253

<210> 363
<211> 403
<212> DNA
<213> Homo sapiens

<400> 363
atcctgcctc ccacagtcac cctgctccca agtgcaacct ctgtctgacc ctgcatggtg 60
tgcggtgccc tcctgcctca gcctcccggg tagctgggac tgcgggcctg cgccaccaca 120
cccggctaat tttttctatt tttttttttt tttttggggg naaanggggt ttaacnattt 180
nggcnaggnn ggtntnnaac tccnnatntg ggggccnacc cgcntgggcc tccnaggggg 240
ntnaaattgn agggggggc naaccncccct ggccccaaan aaatttttt ttggttaaaa 300
ntttttgggn nnggattgcc ccctaaaatg ttccccaatt gggncttatt nttttaaagg 360
aaagncccaa agggnacttt atttttagnn taggaaaaaa aac 403

<210> 364
<211> 132
<212> DNA
<213> Homo sapiens

<400> 364
gcatccaggt atacacacaa gctgcatcgt gtcactgcaa gcggctccca gagttgttcc 60
tgttcatcca ggaagaaaga aaatcccgcc aaagattgag agagatcaat aaatgtattt 120
ccaaagaacc tg 132

<210> 365
<211> 435
<212> DNA
<213> Homo sapiens

<400> 365
tagtaaaang gggcctgctt ccccgtcacc ttccgccaca atcgttaagt ttcctggggc 60
ctccccagaa gctgctatgc ttcctataca gtctgcagaa ctgatgacat ggcatgaagg 120
ccctcaacag atggcagcac ctttaataat gaacttccca gcatccagaa ctatgagaaa 180
tcaatttatt ttcttataaa ctacacaatc tgtggtattg ttatggcagc acaaaatcag 240
actaggacag aagaattctc caacgaaccc attcaggact ggtgctttct gttttgaaaa 300
gttcatattt ctttattttt gnataaataa taccattttc aagttataat gntcattata 360
atgncatatc cactagaaaa tttaaaaaca ctgccatact gagggtttta aagaaaacaa 420
catggactag cattt 435

<210> 366
<211> 330
<212> DNA
<213> Homo sapiens

<400> 366
gaagaatatc naggagccct taaaacactt ngatnaacna tacnaggtta tgcganagna 60
ccctcatttt ttanncaaga ttgcaaagaa aattcatttc agttctacat ttggtgccaa 120
gcgttgttag ttgcagataa ataagataga atccagctct taagaaattc aatctagtgg 180
aaaaaaacat aaatatttgc agttaatttt ttaggcgtca ggcactgtgc taagtactct 240
cattggtgac cttgattttt accctcttaa tctccatgtg ctcccccttc ccaaatacac 300
tccaagtaaa tataaaatct tagtgaaaac 330

<210> 367

<211> 351
<212> DNA
<213> Homo sapiens

<400> 367

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gcttaatttt tcctgatcat gagagaagaa cacagatgta gctgaactaa ggagcaaaaa     60
cccggcatca atacctgcta cagcacagat gcagcatgaa aaattatgct aagtgaaata    120
agccagtccc agcagacaac ttgcttttta tttcagaggc ttataggcaa atctatacaa    180
agaaggtggg tggttcccta gggctgaggg aggaagggaa aactagtgaa gatggctaaa    240
tgatgtgggg gtttgttttt agggtgatga aaatgttcta aaattaattg taatgatgac    300
ggcataactc tcgaaaatac taaagttaat gaattctata ctttaaatga g             351
```

<210> 368
<211> 271
<212> DNA
<213> Homo sapiens

<400> 368

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ctccagctgc atctgatgtc actgctatgg cagtgaagaa tgaaaaccaa aggacaactg     60
gctacttaag gaattaagcg gactaaaatg aaaaccattc acagaagcag ttccagtact    120
ctggctgaga ctctgttttc ctacatacag cccacattct gaatatactc aaatctacgc    180
aatttcaaac ttagaaaact ttaactgctg ccccactgaa gccattttca agctggaatc    240
atgtataata aactactcca tctatttcac c                                   271
```

<210> 369
<211> 303
<212> DNA
<213> Homo sapiens

<400> 369

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ctccacctgc cgagttcacg ccattctcct gcttcagccc ctcgagtagc tgggactaca     60
ggcgcccgcc accacacccg gctaattttt ttgtattttt agtagagatg gggtttcacc    120
atgttagccg ggatggtctc gatctcctga cctcgtgatc tgcctgcctc ggcctcccaa    180
agtgctggga ttacaggcgt gagccaccac gcccggccgc tcttttctta aatatctggt    240
ggaggcctca aaatcaaaat gtctaaaaca gaactcatca tcaataaagc cattcgtcca    300
ttt                                                                  303
```

<210> 370
<211> 185
<212> DNA
<213> Homo sapiens

<400> 370

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tttgtattca agacagaaag gaacacctac ccaggagctc aatcacattg catgcacaga     60
caccgacaac cacacagacg tgtgaacaca tccccccaac gtgagcaacc gcagcataat    120
gggactcatc ccatccaaat acccatttca tctaaagtgt aaaaataata aaaagaactt    180
cttgg                                                                185
```

<210> 371
<211> 294
<212> DNA
<213> Homo sapiens

<400> 371

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gcaaaacatt ctctgcaatg tggggtgagt ggcaatgaga acacctcaga agacactggg     60
tagctttttc aaactcttcc ctccacattg agattcagat ctcagaagta ctgggggaag    120
agggttgaga cttgtggatt ataaatcaaa aaaacctgag gttctgctgc agcccttcct    180
accaccacgc cgcacctccc taccttgaga atcgctttct gtctgttttg atgagaacac    240
tactttcgcc ccaaataatc catcatactg ctattaaaag tcaagttcca aacc          294
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<210> 372
<211> 512

<212> DNA
<213> Homo sapiens

<400> 372
aaaacctgtg gctggtctgg gtattgtcat ggttcctcat ctcttctgga agcacacaat 60
gagagacgga gtctcattct gtcgcccagg ctggagtgca gtggcgtgat cctggctcgc 120
tgcaagctcc gcctcccggg ttcacgccat tctcctgctt cagcctcccg agtagatggg 180
actacaggcg cctaccatca cgcccggcta atttttgta tttcgtttag taaagacggg 240
gtttcaccgt gttggccagg atggtctcga tctcctgacc ttcttgtgat ctgcccgcct 300
cggcctncca aggtgctggg attacaggca tgagccaccg cgcccagcca tatttttaaa 360
ttatctaaag aatgtaatta gattgtttat aatttaaagg atgaatgttt gaggagatga 420
ataccccatt ctccatgatg ngcttatttc ataantcatg cctgtatcaa aacatctcat 480
gtaccccata aatatataca caaaaacttt at 512

<210> 373
<211> 231
<212> DNA
<213> Homo sapiens

<400> 373
aganggtntc tnacgatgnt gcccacactg gccttgaact cttgggctca ancganctc 60
cngcctnngc cttccaagta cnctagacta naggnacang ncgctgntna ntgatgcact 120
tttaatccca atttttagga gctctgtgna atgttntcaa gcattttcca ttttttaatg 180
atttaagtat ttgagcactt tgagctaatt aaatttgaaa ttgtttaaaa t 231

<210> 374
<211> 262
<212> DNA
<213> Homo sapiens

<400> 374
accaagactg aaattggcct gcagatcaaa gaccatggca aaaaattcct gacattggaa 60
actgccttcc aaaacatccc tgtgcctcat ccctttctac acattccata taaagagatt 120
gtttcatttt ccacctggca acgcttaaat tgttttattt ttcttcatta aaaccaccac 180
gcctcttcat tcaaaaaaaa aaaggncagn gnggccaatt cagctnggac ttaaccaggc 240
ngaacttgnt caaaaggggg gg 262

<210> 375
<211> 638
<212> DNA
<213> Homo sapiens

<400> 375
cctcgcgggt tggagggaac aaaactcttc gcgggtcttt cccagtgggg gaatccgaac 60
gggtattcga ataaagcttt tgaatgaagc ccgccacaat ggggaatcgg gcccatttga 120
aacaaagaat gggaattggc acgccaaggg ttcttcccgg cccggctttg gggtgggaag 180
aaggcttatt ccggcttatt gactgggggc acaacaagac aaatcgggct tgctcttgaa 240
tgcccgcccg tggttccggg cttgtcaaag ccgcaagggg ggccgccccg gttctttttt 300
gtcaaagaac ccgacccttg tcccgggtgg ccctgaaatg aaactggcag ggaccgaagg 360
gcagccgccg ggctatccgt ggggcttggg cccaccgnac ggggccgttt cctttgcgca 420
agcttgtggc ctcgacgttt gtccacttgg aagccgggga aaaggggact tggcttgctt 480
attttggggc cgaaagtngc cccggggcca agggatcttc cttgggcatt ttnaaccttt 540
ggttcttngc cgagaaaaag gaatncccat tatngggntt gaaggccaaa tgggcggggg 600
ggttggaana acccctttgg aanccgggtt taccottg 638

<210> 376
<211> 432
<212> DNA
<213> Homo sapiens

<400> 376
gaggaagaga agggcaggga gcaagagtaa aggctttgga gctcagcaag actgggttga 60

atctcagcct cattgtttac ttgatgtgta aaagcagggc ctcactctgt cacccaggct 120
ggagtgaagt ggtatgatca cggctccctg taaccttgaa ctgcttgggc tcaagcagtc 180
ctcctgcctc agcctcccaa gtagctagga ccacagcaac tgaagcctcc tgccaacagc 240
catgtaagta agccatcttg ggagcaaaac tatctggttc tcttcagacc ttcagatgac 300
tgcagcctca gctgacatct taactgcaac ctcatgagag accctgagag ccaaatctac 360
ctttctgagc aactatcaaa cttctgaccc acggaaactg tgagataata aatatttttt 420
gtttaaacca tg 432

<210> 377
<211> 410
<212> DNA
<213> Homo sapiens

<400> 377
aatgcggagt gcccccgaaa agtgcctccc aaaatgtctc aggtcagagc tgcaacctgc 60
gcaacaacgg ctaagatgag gaaaaccaag acacagaaag aaaaccattt tgcataactg 120
acgaacctgg atgagttcat caccaaactc caagaaccct ccgctaggtc tctgcctagt 180
gtccatgaac cagcagcacc ctcattacct gggagctgaa cagaaatgca gaatcctgca 240
cccaccccag acctactcaa tcacactccg tttcaacaag atctccaggt catacgtacg 300
tacagtacag tttgggaagc attgctctag gacagaaaga gtttctcaaa attattagat 360
gaatgatctt attagaccca tgctctaaat aaatgtaaag ataatttttg 410

<210> 378
<211> 195
<212> DNA
<213> Homo sapiens

<400> 378
tctggggagc tcctggttag ctccngctga gatactatna nactctgtga agcccggatt 60
anaaaaaaga tncaaaatac attccgagga gcanatcttt ctgtggtaac actgcattcc 120
anatgtgcga aaaagacagg gaaanacatg aactgcanta cattacggct aaagggagnn 180
ngcttattaa cttcc 195

<210> 379
<211> 241
<212> DNA
<213> Homo sapiens

<400> 379
ggagaaggtc accgtgatgt gatggaaagg cagaaatcaa tggtggctgg ctcctcagtg 60
atatgagtca atccatcaga cagactggtg gcagncaccc agccttcaca gctaccaccc 120
ccatgctggc aaatgtcaca tttggaattc atttgcatag ctgggtagca ctccctgcgg 180
agttacattg aacaattttg cagctgtgac agcttgaaat agaaaagcta atgcaactat 240
c 241

<210> 380
<211> 357
<212> DNA
<213> Homo sapiens

<400> 380
ccntcttctt acaaatganc ngacncagat gcgangannc ncaacgtcca catnnttgaa 60
gcaaagttac ttgtggataa acaaagcatt angaaatgga ctctcatntc tctcaaaaag 120
tatcaaagaa gtgaaattca tcagaccact gtgtcnagac aatgagacgc cnnatgccag 180
attccttant tgncatgatt gcttccttan ccctccctag ttcctgtttt cctgctcata 240
agttacattt cttccttgct atataatccc ctaatttcgg ctggttgagg agatggnatc 300
caaactgatn tcccatatcc ttagctgtag catgcaatta aagccttctt ccttggc 357

<210> 381
<211> 329
<212> DNA
<213> Homo sapiens

<400> 381
atatgctgct tggcaacnat tatatcacac atcacatacg tctggatcaa gtgttacttt 60
gcaaatattc agctatggca ttaaagatcc tttcaagaac ccttttgaat ggcttctcta 120
ggtgacacag caaatggatt cctaagtatg catccattct cccgggtaaa ccacgagtct 180
caaaaagtag gcagcaggct ggacccggtg gcacacgcat ggaatcccag cgctttggga 240
ggccggggca ggaagttgct tgaggccagg agtgcaaaac caacatggcg agactctgtc 300
tgtataagaa ataaaataaa ttatccagg 329

<210> 382
<211> 443
<212> DNA
<213> Homo sapiens

<400> 382
atgtggacaa cgaacaaaga caatagagca gaagtgttgg caacacttca gtatgagcag 60
actggtggac agtgagagat tacagaagaa cacagctctg ggccagcagt gctgctgtcg 120
aggtgatccc agcaggcagt gccacccacc aggaatcata aactgcacaa ggccagaggt 180
gagtccttct gtaaatacat agccctagct ccaagcattt aattgtcaca aaaacaacaa 240
aaaatactcc tattaacagt gcaatttctc tttccaaggt ctacatcgag agaaagaata 300
ttaggatgct aatattgcat tgggtcattg gagcttaatg tttagaaata ataaactaaa 360
ctgttttgtg gtctgaccaa aaaaaaaaag gccagngngg ccaattcagn ttggacttaa 420
ccaggctgaa cttgcttaaa agg 443

<210> 383
<211> 460
<212> DNA
<213> Homo sapiens

<400> 383
gccttcatta tctcacttca caagaagtca ggtgccaagc agatccaagc tcattcagag 60
gctgcaccat gtcaactggg acccaggttt catccatgtt tctgctctgt cattatgtca 120
tactccaagg gagtcgccag atgactgctg cagctgaggc ttttctttca cagcatctaa 180
cagaggctgg ggagaggctc catgaagcac gtggtttcct aataccagaa gaaaattcaa 240
gccttttaac atggcagtcc acagtggtag gaggcggaaa gagactttgg gtattcaaaa 300
atgggttatc accttctact tctttggctg catgatactc agagatacca ttcatgtcta 360
tatctaaatg acactcattt ttttcctttc taaaatggag cacctggctc caaagttctt 420
ggacatctgg gtgatgcagt ggtttcttca tttatccctt 460

<210> 384
<211> 426
<212> DNA
<213> Homo sapiens

<400> 384
ttggttggat ccatggatgt gaaacctggg gataggaaag gcatactgta tcccctgcct 60
tgtagcagct cacaatataa tggggaatgg ttccctgcca gcgaacatgc tgtgtttcgt 120
tcaatcattc aaaacatttg agtgtccact gtgtgccaga cgtgctggtc cctctgctgt 180
gcacatcatc ctccttggtg tgatgctcct tcgaggctca gttcagatgc tacttctctg 240
cttggctttt ccagactgca tgatacccag gctgcctggc tgggtcttcc catgtattcc 300
acccctgacc tgtactggcc ctgttgccaa ctatttatca aattatgtga ttaatatctg 360
ggtattttct tacactggac ctcactcata agggcaggag ctctgtcccg ttcacacacg 420
atcctt 426

<210> 385
<211> 250
<212> DNA
<213> Homo sapiens

<400> 385
gtgggaggag gaagctcgcc aagcgcatga accttcagac catggtggac acgctgcagg 60
aggcagcaca ggaggctgat gccatccagg aggagatgaa tgagaagatc gagcggctca 120
aggccgagct ggtggtgttt aaggggctta tgagtgaccc catgacagac ctggacacaa 180

aaaaaaaaag gncnnngngg ncaattnagc ttggacttaa ccaggntgaa cttnntcaaa 240
aggggggggaa 250

<210> 386
<211> 165
<212> DNA
<213> Homo sapiens

<400> 386
ttgttgcgna nangacacca acatggnata cgaacccaac ggtggggaga agacnnanct 60
gntcagaann ccccaggagt aaaatgcagc ctgtattacc cttcctggag tgtatcctac 120
ttggagtctt cttgttctgg gaggcaataa atttctttgt tattt 165

<210> 387
<211> 397
<212> DNA
<213> Homo sapiens

<400> 387
ctcctgcgtt tctgcagagc tcctgcatta nntcaganct gcnatgnnat ctggnctgan 60
tngtgtctct ccaaattcat atgttgaata cttaacctgc catgcgattg tnattggana 120
taattccttt agggaagcaa tgaaggttaa atgaggtcat aggtgggagc ttaatccaat 180
gggactgggg tccctacaag aagaggaaga caccagagct ctctgtctcc acacacagag 240
aaaagaggct gtatgaggac acaagagaag gtaatagctg tctacaaacc aagaagagaa 300
gcctctccag aaaatgaacc ctgctggaac ttggtcttgg actttccagc ctccanaact 360
gggagaaaat aaagttcaaa ataaagttct gttgtgt 397

<210> 388
<211> 232
<212> DNA
<213> Homo sapiens

<400> 388
gcgtttccac actgtcttac tgtccggaaa gagcaaacac ggtggaaagg gacagaagag 60
ccagaattcc gtctagtttg atcactgatt tgctgggtga cctggtgcat ttcacttcgc 120
ctcagtctct ttatctgtaa tatgagaatg cgcagatttg cctcctaagt gtgatgtgag 180
aattaggtga gagttggcag gcactaaana aaaaagcatg cattaatcct tt 232

<210> 389
<211> 167
<212> DNA
<213> Homo sapiens

<400> 389
gtaaggaaac atgaacctgg agagataaag tgacttctcc caagattaag tggtctctaa 60
aaggcagtgc caggactcag acttctgact tgaaatcaga gtttcttttc atcatcacat 120
ccttcctttc taatctgttg ttaataaaac tcttggtttt ctaggtc 167

<210> 390
<211> 187
<212> DNA
<213> Homo sapiens

<400> 390
gtcaccagtg gctaagcaag acccacagga tgctgccaac aggtctgaag gcttggtaca 60
cagtagggag aaaacagaga aggtgaaagg aagatgggca aaaagaagag tgttaagaga 120
gaaagaagaa gtatttgaga tcctgccact gcactccagt ctgggcaaca gaacaagatg 180
ctgccag 187

<210> 391
<211> 282
<212> DNA

<213> Homo sapiens

<400> 391
gtttaaggag gcacaaatcc aggtgttccc acattaccaa attactactc tgtagtttga 60
aaggaatgac aatgacatcc tgtttctggt catggctaat ttagtataca ctgcacctgt 120
aaaactccag gccatcaaca tttcaggaag gctatgtaat caaagtggtg acacttacta 180
ctgagaatta ttggtgactt ccagagtaca gcacaagccc tctctccacc tgactttcaa 240
ttacaacaga gggtcagaag agtccaataa aggcagaacc tg 282

<210> 392
<211> 146
<212> DNA
<213> Homo sapiens

<400> 392
caacatggag acaatgtttt cctgcattct tcattccaga agctgatgga ggaaaggccc 60
tatgagctgt gggctggctc tataggcccc actgtacttt agggaattcc agtagcaaag 120
gaataaaatc attttagtca ctatgc 146

<210> 393
<211> 190
<212> DNA
<213> Homo sapiens

<400> 393
tgtcaaggtc aaggtgttga acgtctttcg agtcacgagt aaccagttat attggctatt 60
tcagaatgct ttacagccaa aaagtccttg aacgaaggaa gaagtccact aagtctcatc 120
agcaagggtc cagctcctct tcatctgcat gttttgaaca ataaaaatga ctaccacttt 180
ctgagaacct 190

<210> 394
<211> 303
<212> DNA
<213> Homo sapiens

<400> 394
atggaaatca gcttccagtg tgaaccactc tatggacaga ctcaaatgga aaagaactga 60
tggagaccct cagctcacga ctggcaagga attgacatcc tcagttcaaa aacctgtgaa 120
gagctggatc ctgccaacaa ccacgtgact gagcttggaa gaaaatcctt cctcaaatga 180
accttaagat acctgaaacc ccagtggaat ccttgattgc ttaattgtaa gagactatga 240
gcaggaatat ccaacctaag tgaaaacaca ggaactgtaa gataataaat gtgtgtttta 300
agt 303

<210> 395
<211> 117
<212> DNA
<213> Homo sapiens

<400> 395
gtggctgtga tcttgaaggc aaagacttgg ctttatagca cccagcctat cagccatcag 60
tcaaaaaaat ggaccaagtg ttgagtcaat taacttttct taaattctct tgaccag 117

<210> 396
<211> 244
<212> DNA
<213> Homo sapiens

<400> 396
gcagagaaca catcatcccc ctggaacgtg agtcatttgt gaaatgcttg ttttaaattc 60
aaacttcttc acaacctgac gagtgtgtgg gagacccaag gaagctgaca tacaagggca 120
gatttatttt tctgccagaa ggaaccatca acacaaaggc caatggtaac cctaaaaatg 180
gaaatgtgct aacccttttt attgtcaagc aaataaaaaa attattcttc aaaggaggag 240

aaac 244

<210> 397
<211> 168
<212> DNA
<213> Homo sapiens

<400> 397
taaanttgaa agtagctgat atgggaccac agaatattgg ccaatcagtg ttttacataa 60
tgtctgtgga gtggccatgt gctctagaag agtgagacaa ccttggcata accttcttta 120
agagccaatc acataacact gtgaatattt ataaaatttt agaccatt 168

<210> 398
<211> 477
<212> DNA
<213> Homo sapiens

<400> 398
gcgtctgggg agctcctgcg attntgngga gctnctgcan naaggctnan tgnaanatnt 60
ntgctgnant attngnnatc nacantgacc atctccaggt ttctacattg gaatccaact 120
tcacaagaat ncacttgacc cactatactg gaggaaactt ccctgcatgg ctagcctggg 180
atgctgtggg tcacaagccc ctccctagaa gttctcctga gtatctaact gcagtccctc 240
acactgnaac ttcttccacg ctgctgcttt gtagtctctc ttttaacctt acacatcaag 300
aagtccttct gagtatccct gcaatgtang atgaagcaat ccactaccca ctcctgcact 360
gctctgctca gaaccagcac cctccctcac ccccactccc atccatgcca agaatgctgc 420
acttcttccc cgtgagccag ggtcagcccg aggagagggg cacaagcaca gggcctc 477

<210> 399
<211> 261
<212> DNA
<213> Homo sapiens

<400> 399
atgaaatctc agtacagacg cacttttttg ttaaatacac tancaaggna gttagtgtat 60
tttgcnnaga aaatgcnana tgnttggaat atcttcaaca ttctcanatg tgggctctaa 120
atccaacaat aattatcctt ataagagaca gaagaggcac nnatacnaaa gagaaggcca 180
cgtgaaggga gtgtggccct gctgacatct tgatttcgga ctttancccct tnggaactta 240
nataaacctc tgtaagctac c 261

<210> 400
<211> 139
<212> DNA
<213> Homo sapiens

<400> 400
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caagttagtg catttattt 139

<210> 401
<211> 415
<212> DNA
<213> Homo sapiens

<400> 401
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acattctgat tgcattgctt gagaaaattc tcagtctggg aatctcctta aaatgcagca 120
cagatgatgg ctgaatagga acagctccgg tctgcagctc ccagcgagat caacgcagaa 180
ggcgggtgat ttctgcattt ccaactgaga acaacgaaga aaaaatttct tttaaagaaa 240
ggccaaagaa ttattataga tcttttcttt cgacattcct aaacaagaac aggcctagat 300
ggtgtcattt tcaattcttg tcctaactgg tcagtgacca aaacctctaa aaattcacaa 360
agaagctcat gaggaggtcc gaggctgcca aaaggcattt ggtctctggc ccaag 415

<210> 402
<211> 360
<212> DNA
<213> Homo sapiens

<400> 402
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cttagcatca actcgggcag tgacccactg tgaccctgtt ggttggccat accaacacct 180
gccgggcaaa accccatgcc tgaggacttc tctgggcttt gctactacca aacctttaat 240
gccgggtcta agatgaatga aaatggtttt ctatgaagac cagtatataa ggacagagca 300
agattcctca tcttcaaata tttattattt ccttcttctg gtattagcaa atttggcttt 360

<210> 403
<211> 433
<212> DNA
<213> Homo sapiens

<400> 403
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tgggcttcct tcactcaacg tcatgtttcc aagatccatc cccattgaag ctggtgtcgg 120
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cagcaagagt gatgagatgt cacttccgag attaggttgg acggatggtg acttccagct 240
tgttagtctt ctctcgggct cttcttgttt gcttgctctg gtgaagccag ccaccatgtg 300
ggttcctggc atagagtttc taaaaccact ggaatttcct aagtaaaagg ggtgagagaa 360
gtgtcttttg ttactcataa taagccccct tcaaccatac ttgagtttat tctaanaggc 420
ctagttgacc tct 433

<210> 404
<211> 385
<212> DNA
<213> Homo sapiens

<400> 404
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taatatgctc aaatgcatgt caaaatgaat gaaagatctg cagcacacaa ggctatgcct 120
atgtactgga ccagaggcag aatatatatg tagcagtttc caagagccta tcaaggacgt 180
cagggactcg ctgacacttc ttcccaaacc agcagnctgg gaaccatgga tatccatcaa 240
gaaggggaaa ggtagcactt aaaaccccaa catttaaatc ttaanagcac tgggaagtgg 300
gacagatncc ncccaccttt ttttcaaagg aacggaaggg cctaccttca gccaaaacaa 360
ngtaaggttt tttggtttgg aaaat 385

<210> 405
<211> 416
<212> DNA
<213> Homo sapiens

<400> 405
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ggtctcctag gctgctgccc tccatacggt gactcagcaa ttcagcctgc gtctgtctca 120
acacaaggct tccagaatct ccaccgtggc acagaatgag agctggggag tcctgcaagg 180
gctcttcatg gcctcagcct ggaagtgatt ctcctcactc acactcagag cacattggcc 240
agaatgagtc ccaggccctc atctaactgc aagggggctg ggaaaagcag ttttcttggg 300
taactgggaa ggaaaggcga gtacacatgg atgagcgcta gaagtctcta ccatagcagc 360
tggacaaaca acggtggagg agcattccag gcagaaggaa cggaaaaggt gaagac 416

<210> 406
<211> 256
<212> DNA
<213> Homo sapiens

<400> 406

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gaagatcatt gttctcagag aagttcttca tgttatggat ccgtgactcc ttaatacatt 120
ttcctacttt tgaagaaatt gaactgaatt tattctattt atataacagg aaagatgcca 180
aactgtggat ctgcttattc aaagtgactg aattttgtca ggctatttat caacaaataa 240
agtatttgta attatg 256

<210> 407
<211> 558
<212> DNA
<213> Homo sapiens

<400> 407
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nacattttca aanggggcat ntnaaaaaat tcncgngngg acccccancn cnccncagtn 120
tntccccccc ccaaaggggc aanccaccng tacccaanac cnttggcact tttggtcttt 180
tgggaagtcc ccggtttacc ttcttggcaa gttttattcc tttggggatt ttncccagga 240
anaacttacc cncggaattc tnaaaaaccg gtgccncttg aattggttcc caccancatt 300
ttttcattta agtagcccca aaacaacccc agaattaaat gggaccaaaa tcttatggtg 360
ggggcattat accccncacc atnggatgaa tttacttcan ccntttaaag aagggaaatg 420
gaggggccct tgctacattt cttttcaaca tnggatnggg attaaaccnt tggaaaacct 480
tggatgctta agtnaaaaag aagggcaggt ccccaaaaga cttcatttgg gatgaaagca 540
ttnccagaac aagggcca 558

<210> 408
<211> 419
<212> DNA
<213> Homo sapiens

<400> 408
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tcttcaggga tatagaaaat gtaccctcct catcctgaca aaattttgca gatctctgga 120
gggctataca agaagaaatt tcagagaaac cctaaacaaa ctccacagct ctttgcaatg 180
ccaggaagaa tttttaccat tatataaatg ttaggtttaa tttaatcatt cacataatgc 240
ctactgatgc attctcttgc atagcatgtg atgtgaaatt tgtgatttgc cactattgta 300
ttaaaaaata agcattaatt acacactaaa attaagccat ttgaatcttg gaggaggcaa 360
aagccaaaga aaatgtgcag ctggtcagga agtaaatcca gggtggagaa atttttgtc 419

<210> 409
<211> 447
<212> DNA
<213> Homo sapiens

<400> 409
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agacatggaa cangcctgca gaactttgga gagtatggtt tggactattc ctgcactcag 120
cgatacggga caagcacaga atgcaataat atttaagttt gttcaaaaag ccaaatgctt 180
ttgcaaaata ctctttttta tttaatagga aatagagatt gcttatggaa gagtgggatg 240
ggaacctgtg gaaagacatc ttaaatccaa cccctggcag tctgacatan ggctgntgnc 300
aaatccccat agncacactc ccaatcacaa tgcttcttag atcccctaac ccaccgcanc 360
ctaaggccta caaagacagc tcaatggctg ggcncggngg nttacgcctg taatcccaca 420
ctttgggaag gccnaggcgg gccggat 447

<210> 410
<211> 167
<212> DNA
<213> Homo sapiens

<400> 410
agtctgggac tcctgcatta agtnatanct gatacggncg gacangtagg gatcgtctat 60
tgnatgtgaa accagagatg cccgccaacc tggaatagag aggaagagag caggcagatt 120
tgnacctatc tgctttcaag ctggtcatca tgatgaaact tagacac 167

<210> 411
<211> 255
<212> DNA
<213> Homo sapiens

<400> 411
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tttcctaacc gatcctttgc aagaaaagtt cacccactcc tgtagtcagc agctccccta 120
ctgtgcgcag tcagtgtgcc atctcagact agcaaagatt tgtgcttgga tcatctacac 180
ttccctgaat gctgaagaag atatgctatc catgcaatcc ttgtcgactg cttgattaaa 240
aagtggataa actgt 255

<210> 412
<211> 111
<212> DNA
<213> Homo sapiens

<400> 412
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ctctttgcaa atgaacttgt gcaatgtatt aaaacatttt taaaagttca t 111

<210> 413
<211> 561
<212> DNA
<213> Homo sapiens

<400> 413
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ggcgaagaca gtaccaagtc attgcntnat ctncactcac attcngagtt cctgagcagc 120
tgctctggag gtggattaaa ataacccatc atttcagttt ttataaccca ttcagcattt 180
aggaataaca tggatggttg aacccatgga tacagagggc caactgcaca tacnatgaat 240
gcttgaagtg cactgatctt cagtgaacag ctcactgact ctttacaggt ctcaaactcg 300
tgagctcaag cgatccgcca cctcagactc caaagtgctg aaattatagg catgagccac 360
catgcctggt cagcattggg gagtttcaag aactattcca gcaaaggagg ggaacttcac 420
caccgctgca tgtctacctt ggaaagtcan gcagcattgc ttctgctggg ttctctttgn 480
tacaaatatt gaaaatttgc tacctgcacc tgctgtgttc ccaccctctg gagacctggg 540
aacctggctg cacctgggaa g 561

<210> 414
<211> 569
<212> DNA
<213> Homo sapiens

<400> 414
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gtgggagagc cagcgccccc cagctccagt caggtctcac tccctgcaac acgagcaaat 120
ggacatggcc atgggggcga ggactggggg gcctgccgag gagctggagc catggggtcc 180
ccagaagtag aggcctagag gcagcaccgg tacccactgc acctcagggc tgctcggtga 240
ccgctctcag ggcagccctg ggctgttctc aagatcaact tcaccctcag gagactaagt 300
tatgcccagc tgaggatgtt cacaaggaca cactgcaggc cctagaggca atacccctgg 360
agaggctcca ggcccacgga ggacgtggcg gccggtgagc aatccaaggc cctggcccca 420
aggtggactg gggtttgccc ttccacctgg gacattccaa gttcacgttt tctcangtct 480
catttaacaa ggaaaaaata gtacacacaa gcactcacgt ccacaaacaa cttcttttct 540
tcctnaaaaa nggaaaacca cctgggcca 569

<210> 415
<211> 433
<212> DNA
<213> Homo sapiens

<400> 415
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caataatgaa gttaccatat tgctccagac aagagatgct catggcctca tggcctgaat 120
taagcagttg caactgaaat antaaaaagt ggccatggtt gagatacatt ttaaagatcg 180
aatctacaga atataacana ggattaggtg ctgtangaaa tgagaaaaga ctgatggcca 240
gttttggatt cagcagtggc tataatcatt gtgctacttc ttgggggaag attggtagag 300
atatgggata ggagggaaaa tcaaagaagt tnccatttta aaccccgtta aagtttgaga 360
caccaataag atatacaagt tccaaaggtc aattaccagt tttggatatg tgaattcaaa 420
aaagtatgag ctg 433

<210> 416
<211> 265
<212> DNA
<213> Homo sapiens

<400> 416
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tccacccaac agcaagttct gcacacccct atgattgctt ccccaacgaa tcagcagcag 120
ttattcccta gccccctgcc catcaaattg tccagaaaaa ccctaagccc caagccttca 180
gggagactga tttgagtagt aactccatct cccgcatggc atagctggac ttggattaat 240
taaactcttt ctttattgtc gtgcc 265

<210> 417
<211> 501
<212> DNA
<213> Homo sapiens

<400> 417
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cctcctcctt gtccccacgt caagagagag cagcgggacg agtggaccct tnggaatcct 120
acctggggct tcccttccag gtggaaggga agtaggagcc aagatgcana ctccctgacc 180
gcaggcgctg ggccagccac aatgccatct tgcccctacc ctggtttatg attgtttttc 240
acctttgggc ccttggccag agaattccct ctgcctccaa tgtacgccat cccctccttt 300
cctttctgcc tgggacactc ctgcctatgt gcatgggcca ggtctggcct gctgccatta 360
ctatgtggcc atgagctaag aatggtttta tgtttttaaa tggctggaaa aaacatcaaa 420
ggaagaattc tattttgggc atgtgaaaat tatctgaaat tcaaatatca agtatccaca 480
aataaaatta aattggaaca t 501

<210> 418
<211> 324
<212> DNA
<213> Homo sapiens

<400> 418
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ctctggaatc aaatcattat gccgaggcat ccaggctgag ggtaacccag gatgaaatgt 120
ttcccaagat cactgggacc ttcctaccca catgaggtca tcaactgaga ctggctttct 180
ccagaccaga cttggaggtt gatgctatct tcacaagtgt gcaaaagtca ataagagttt 240
tgtgtaactt tgctcaggat actttgaaaa attgtttaat tttttatttc tggttatgca 300
tattttcaac tattaaaacc atgc 324

<210> 419
<211> 433
<212> DNA
<213> Homo sapiens

<400> 419
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agcaatgcaa tgggcacacc agcaggctct tgaaggcact gccatactgc acagcttcca 120
caggcctgga gcctgaatcc tctgagacac atcgtccctg aaattgaaag attggcactt 180
cacccacacc tgagacggga aacatcatct cttcctagga ggacctgtgt gaccccgcct 240
gcatgaaagg tttgctcact cggtctgcag tggcaggccc acactcggca ttccccggag 300
tcctccagtg cctgcgtgca ctttctcttc ttggttggag gcaatgaggc tctaaaatca 360
aagacaccaa aacgaaggnt aggattcttc cttgngtcca tgntatgtta aataaaaatt 420

aatcttccaa gcc 433

<210> 420
<211> 449
<212> DNA
<213> Homo sapiens

<400> 420
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ccaacctcca aagcacggnt ggagagcagn ggngcaatct cggctcaatg caacctccgt 120
ctctccctgg ttcaagtgat tctcctgcct cagcctnccg agaagctggg ntaacagcgc 180
ccccntttta cagatgatac cattgaggct natcanttaa atnncctggc naaggccaca 240
ctgtggaact gggattccaa tcaggtctaa ctccaatgca atactccttc cattatactt 300
tctttaacct gccatactaa catagcacat agcctgcgac agtttaaaaa aaaaaatcct 360
ggccccctta aaataagtga ttcattattt ttttaaatta taaactgcta ctgccaaata 420
gaaaagtaaa gtcgtttcat taaaaatgg 449

<210> 421
<211> 308
<212> DNA
<213> Homo sapiens

<400> 421
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aaaagtcaag atgttgaaaa cgaaatttta aagggccttg tcgaagtcat cggcagtgaa 120
gaatgagatg ttaaaatcag atgtgatatg catggggaca ggagccattc aaaggccggt 180
ttcatcactg aacagctaga cctccgttct ggttggccaa cctcaggagc tgatggatac 240
aggttggaac caagcccagg ggtcctccgg aagaatctaa aacaggcaaa ataaaatgtc 300
ttccaaac 308

<210> 422
<211> 327
<212> DNA
<213> Homo sapiens

<400> 422
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gaataagaac cctcaactgc tgtctcacct ttcagatcac gaagaaagtt ttttacaatg 120
agcagaacac tcaacctgaa agcagaatgg attgagtcac tgcagccgtg gcagtggaat 180
ggtgtttgat gttggcaaag gaaacatgta cttctagact ggacagtttt cccttagttt 240
acagtttcca aatagagaca tcactttgaa ataacatgga gaacatacat ggatgtactg 300
aacgaagaat aaagtctgtg ttgcaag 327

<210> 423
<211> 284
<212> DNA
<213> Homo sapiens

<400> 423
cagaggaaga ggagcgactg aagaagaaag agggtggagg tgaagatgtg gagctcatat 60
tgaatctttg gaaaagtgaa aatggctttt agtatccagt aagaagagta aatagaagaa 120
ttttagccac aaatggaaaa gaaaacgtct cttcctcagc tcaaagagac aagctcttgt 180
cagttcctgt aaaatttaat gctggtgggc ctggaagcac atttctcaga caccctagca 240
aataggaatg accaagtaat attattttgc caataaaaat atgc 284

<210> 424
<211> 464
<212> DNA
<213> Homo sapiens

<400> 424
gtatattacg ttcttatatg aatgacagac nanacatgga atttgaagga aaggaagatg 60

accgttaagg tggtanggcc tttganccca agctaagcca tcatatcccc tgtgatcttg 120
cacctacaca tncagaatgg cctgaagtaa ggtgaagatc cacanaagaa gtgaaaatag 180
ccttanctga tggcattcca ccattgtgat ttgcttctgc ctcaccctaa ctgatcaatg 240
tactttgaaa tctcccgcac ccttaagaag gttctttgtn attctcccca cccttgagaa 300
tgtactttgt gagatccacc ctctgcccgc aaaacattgc tcttaactcc accgcctatc 360
ccaaaaacta taagagctaa tgataatccc caccctttgc tgactccttt ttcggactca 420
gcccacctgc acccgggtga aataaacagc cttgctggtc acac 464

<210> 425
<211> 317
<212> DNA
<213> Homo sapiens

<400> 425
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naaaaaganc nngtaaggag gancggagga aggcntttaa ttgacagcct tcgaggaact 120
gaatcctgtt ggtgaccatg tgagggagct tggactccgg tccccctgtg ttgagccttc 180
agatgaattg gcagncccca gcttggtggc atgactgtaa cgtcctgaaa caccttcagc 240
ccagaaagca ttcagctaaa ccacacctgt atttctgacc caaagaaatt gtgagataat 300
aaacatttct tctctcg 317

<210> 426
<211> 259
<212> DNA
<213> Homo sapiens

<400> 426
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cnnntnanna tngaaccacc ntcttaaant tntgggagga taaagcatca ggttaaaagc 120
tcacctggat ttgcgtgcct gagcagaaag acagaagagg cctgggaccc aactagcatc 180
atactactgc ttcatcagcc tagatgactg cctaccttcc tatctttctt acaagacaaa 240
ataaactccg tatttgttt 259

<210> 427
<211> 403
<212> DNA
<213> Homo sapiens

<400> 427
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ngaaaaggac tnccanatng aattgtgttg gntattcata tcccccagca cctcaaaatg 120
tggccatgga ggatggagac agagattgga gtgatgcatc ttcaagccta ggaacactaa 180
ggattgctgg taatcaccag aagctggaag angcaagaaa gtgtcctttc tagagccttc 240
agagagagcg cagccctgcc aacaccttga ttatatgctt caagcttcta gaattgtgag 300
agaataaatt tctgttgtta taagccnaaa aaaaaaaagg cngncggggg ccnttnagnt 360
gggactnanc caggcngaac ttnttcaaaa ggggggggg ccc 403

<210> 428
<211> 376
<212> DNA
<213> Homo sapiens

<400> 428
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agcaagaagg tcactctgag ttcctcctgc ctttcaatgt gagacctgcc aaaagggaat 120
tctctgtcct acctcaactg aaagtagctt gtaagaactt catctcaaag ggtactgcа 180
ttatactctg aggccaagaa aagtcaacgc agaggccttc ctgggtccct ctcccccaat 240
ttgttaccat acccttttgt cccatcatac ttctacatga ttttactgaa tctaagcaca 300
aaaatactca gttgtcccct gggtgttggg cctcatttct aatgggtttc gttccccata 360
aaactttggt taatgc 376

<210> 429

<211> 394
<212> DNA
<213> Homo sapiens

<400> 429
gcttcgcatg tnttanaggt cctacacnca nattcaccta ctncanggga ttcaagtccg 60
tcttatgttc tgntaatgac aactcttntt gaagttcttc anggccgtgt gaaaangaaa 120
agccngccgg gcacagtggc tcacgcctgt aatcccagca ctttgggagg ctgaggcggc 180
ggatcacctg atgtcangag tgcgagacca gcctggccaa tgtgtctgta ctaaaaatac 240
aaaaatcagc cgggcgtggt ggcgcatgcc tgnaatccca gctactcacg ancctgangc 300
aggaggatng nttgaacctg ggaggcggan cttgcattga gcntgggtca cactactgca 360
ccccagcctg agagaaagag caagacttcc gtct 394

<210> 430
<211> 343
<212> DNA
<213> Homo sapiens

<400> 430
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cctgcagata gcgagaactg ctgcagcagc cgccctagac cattctgcag ttctgatgca 120
cagcatgatg gaagcatatt gcagaagatt attctggctt ttgtagatag tggattaaat 180
tgggacagtg taagaatggg aattcagata gcccatggat ggacttcaaa atatcaccct 240
ctaaaattgg actcaaattt catgttcaga tgcccgtttt ccccactgca agaggaatcc 300
aactttcatc agatccttgc atcaattaaa ctttccttac tgc 343

<210> 431
<211> 373
<212> DNA
<213> Homo sapiens

<400> 431
ctcctgctta agtcgaactg aggggnntca aatagcnata nnntccctng nnacnggcng 60
ccacntccaa anggccggtt cnngccttan tgatgncatt tccccaaaan aagngaaant 120
ggcctgttcc tgccttactg atgacatggn cttgngaaat tccttctcct ggctcatcct 180
ggctcaaaag ctcccctact gagcaccctg tgaccccccac tctgcccgcc agagaacaac 240
ccccctttga ctgtaatttt cctttaccta cccgaatcct ataaaacggg cccacccccta 300
tctccctttg ctgactctct tttcggactc agcccacctg cattcaggtg aaataaacag 360
ctttattgct cac 373

<210> 432
<211> 386
<212> DNA
<213> Homo sapiens

<400> 432
gtaaaattga cttgaagtcc actcagcgtc actgtatgtc taaaaataaa gaagcttgga 60
aagcctggat ggaaccctga gagacaggct agtccctcaa gcagttgcta aagagttgag 120
cggtttcttc tgaagttcaa gataacacta ccgaagaatg ttatcaccgc ctcgttctac 180
aattcgctca agtgaatcct gctaaatctt tgctcttctc acgagtcaga cctactgcta 240
ttagtggaaa ctacttatga aatgaatttt atttctaaat ttctaatcat cttgcaatgc 300
aatattaggc attgtcctct cggtccgcta acctgatcaa actggggtcc ctaaatccaa 360
acacgcacat acagcgtgtc ttctaa 386

<210> 433
<211> 267
<212> DNA
<213> Homo sapiens

<400> 433
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cacgctatag agggccatgt gggaaagcac tggagtagct ccaggccggg cttgccagtc 180
tctctgcact ctggaaggag tttgcctggg ttggggttgc ccttgtanat tccaaacctt 240
cattttgtca atttacttaa aggtgac 267

<210> 434
<211> 243
<212> DNA
<213> Homo sapiens

<400> 434
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caggtgagca ccgccaagcc tgacctcaag ttgaaatgtg atcaccaatg ttggagtggg 180
gcttaatggg tggtgnttan gctnngnatg aaaccattgn cacnaancca atggggatgg 240
tct 243

<210> 435
<211> 307
<212> DNA
<213> Homo sapiens

<400> 435
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gctagcctga gaaatgtgga atgcctggct tctctgacta gtgttgacac agttgtttcc 120
agcgtgaaca tacctgtaca agtgaagcca tcacctgtgt atccttcctt gcacagacag 180
cggtcaagaa aaaaacctgc aacttggatc caatataaac gatgacaaat ttcaaagaag 240
tggaagctaa attaatgaaa aatgttatgc aaaatgtttt ataatatagt taaaatgtat 300
gagtttt 307

<210> 436
<211> 332
<212> DNA
<213> Homo sapiens

<400> 436
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gaagagttac caccaaccaa gacaacaaca ctcagaagac tgatttttga acgattttcc 180
aacactcacg tctcaattcc tcttttctaa aagtcaacaa aatcctggag catatcgcca 240
gttttcctta caattgatgt acatgtttgc tactaatttc tatggactcc cttaagtcct 300
ataaattgtc taccaaatct tcaaaaaaag cc 332

<210> 437
<211> 392
<212> DNA
<213> Homo sapiens

<400> 437
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tcaggacttc ccatcccaga agataaaggt gaggaaagca gcagcagcag ccacaggcca 180
gtattccaga gcagctttgg gttcctgtca agacctgctt tgagaaggag gtggctgtgg 240
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tgagaactgc gacacgaggc ccagtcctgc tactaaacca actgtgtgga cttgcatagt 360
cacttcaccc ctcgggcctc catttctcca ct 392

<210> 438
<211> 351
<212> DNA
<213> Homo sapiens

<400> 438

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ccaccnaatg ctacanaagn gctggngtta cttacctaaa cctacaatgn gaagagaatn 120
tgacactatg atnccanctg gaaaaccacc ancacccaac atgcgngctn ccaatctctc 180
gaatcgtcac tgtgcctccg aacaccactt agttccctca aatatgtcct tctaacaagc 240
aggcgtgctt tcgtgtattt agaacaaatc ttaaatgtac acatgcatcc aaatcttaaa 300
attcagaata aagaaaagca gagaaggaca gaagaaagac taatgctacc g 351

<210> 439
<211> 396
<212> DNA
<213> Homo sapiens

<400> 439
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cccaaaagca cttggaatga gcccagctac nccaagggtn ggagatntgc caatatcatg 180
gagggagaaa tacacatcta gnntatgacc cagcatncca naggcctgca ggctaacccg 240
cctncctgga agaaaacaga aagtagaggg cctgtcactg ctggagatac ccacgatgga 300
gacaatgctt cagcagtgag cccaggtgtc gccatgcaat ggcatgagag ctctgccttt 360
gtccatcgac atggaagtga aataaaaaga aaactt 396

<210> 440
<211> 350
<212> DNA
<213> Homo sapiens

<400> 440
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gcctctctac aaactgagtg ctgactgtga ccctccatga tggggaagaa aggatcatac 120
cctttccacc cttacacttt ctaggcaaaa tacacagtaa tcatcaagga atttggttag 180
gccctcatct gactggttcc ctatttcctg gatcccatat ctgattcttt ctctgtttat 240
tcccctattt tggaagacca catcctttct aaaacagtgt gcatcagaag ggaagtgttt 300
tctacattct gcatcctaaa aataaatgtc tctattctac catgtgactg 350

<210> 441
<211> 374
<212> DNA
<213> Homo sapiens

<400> 441
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gggaaaatgc ccaanggatg cttntaaaaa tcaccaccgg nctttaaacc attgccccaa 180
aaccgggtaa gttttgnggt gttgggcttg ggtccacttg tccctctggn caacctaaca 240
agggagggna agaaaccaag ggcttaccna aanggatgtt tctttcctga ggggaaacca 300
ctcctataga ctcctctnga antccaggaa ggaagtgggn aaaacccatc ttcnnttaat 360
cacatttttg ggat 374

<210> 442
<211> 153
<212> DNA
<213> Homo sapiens

<400> 442
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cagaacccag atattgtaag gctcctggag aaaccctgga aacatctact tctcaacgtt 120
ttcgcttgtg agctaatgaa acaccctatg gtt 153

<210> 443
<211> 77
<212> DNA
<213> Homo sapiens

<400> 443
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aaattttcc atctgcg 77

<210> 444
<211> 430
<212> DNA
<213> Homo sapiens

<400> 444
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gacgccaagc tccgggaggc tgcagtggcg gcagctgagt ctgcaggtgg agaggtgcag 120
ggactgtttt gcctccacct ccttcaatac ctacttttct ttccagcaac agtcccttcc 180
cttacgctcc cgaatccacc ctggccctga ggctgcacct gagtaccaca tcctgacccc 240
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gtaccactta 430

<210> 445
<211> 337
<212> DNA
<213> Homo sapiens

<400> 445
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cacatccttc tctggcaagg ggaatgaggc tgagaatgac ctccatcctc aggacgaggt 120
attaaatatt cagcccatgc cagagtgagg atctcctttt caccttctgt ctgaattgtg 180
ccttgaatct gtttcgcgat gggtgcgaac tgggtgagac acttgtctta gaaccgcagc 240
cctggcaact ccacgccgcc tgacctcgag ccggtttcca tagcctgaat ccttcctctc 300
atttgcaaac aactttctta gtaaatgatg acaaagc 337

<210> 446
<211> 266
<212> DNA
<213> Homo sapiens

<400> 446
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anaggcctac aatgagctat tgcagtcacc agatggggact catgaatgca gcaggtgggg 120
cagatggcaa ggcgccctgt ctgatgctgn ctgcctgggc atggactgcc ttttccttcc 180
agacctttc ctggatatgg ccaagtctga agtttcaaaa tacatgttat tctgaaccta 240
ataaagaaaa catatatcca accttt 266

<210> 447
<211> 443
<212> DNA
<213> Homo sapiens

<400> 447
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gttcctgcct taactgatga catttcacca caaaagaagt gaaaatggcc tgttcctgcc 120
ttaactgatg acatggtctt gtgaaattcc ttctcctggc tctcctggct caaaagctcc 180
cctactgagc accctgtgac cccactctg cccgccagag aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcaca 360
caaaaaaaaa aaggncnnng nggccaattn agnttggact taaccaggcn gaacttgntc 420
aaaagggggg gggactaccc ccc 443

<210> 448
<211> 514
<212> DNA

<213> Homo sapiens

<400> 448
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ttccaccaaa gagatcatta atgtctcaaa acgtctccaa ggatacatga tctacaaagg 120
accacagagt gccctgcaga attgggttga aaaactaaag aaggcaaaca gagtttatgg 180
taaggcggca gtctctggtc cccgttgtga gattgggttc ttcctgcctg ttcctggagt 240
ggcatggaga aaagagcatg gatttgcaga agagacactt gagagagagc tgactgtgat 300
ggtgatgctc acagggaccc ttgaagacat gagttaaaga tcgtagaagc atgacaagtt 360
ggatacctga atgactgtgt ggatctgagt ttcccagtgc cctgcagtac atgatcacat 420
tgtttatgag actgactatg tctgagccan aattgattgc atctatttga tgctgcaact 480
taacctgtgc ttaacactat ctctggggaa aaaa 514

<210> 449
<211> 239
<212> DNA
<213> Homo sapiens

<400> 449
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gcaatcaaca gtgagccaaa tcaaaaagca gcctacattc tacctgataa tctacacaca 120
ggctgggatc tgctgggttc tactaggtga attgaattgc tccatgccag tggaaaattt 180
tttcacatca gtttttccta gtagatgttt aaaaaattac aaagaatttt ccaatcgac 239

<210> 450
<211> 503
<212> DNA
<213> Homo sapiens

<400> 450
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ttcgaacatc tgaattatga cttcctgttc ctgggatgat gctggggaca gccaaaaagt 120
tttagagcca gattccttat ccaatgggca aggaaggggt ggcctgttga aacatcctga 180
aatacatcaa cccaaaatac gaccaacaaa aatgtggctt ccaaaaataa ctccgccagg 240
cgggtctgtg tgccggctgg gaggaaagag aggtgggaca gaaccagctt ggaccttccc 300
ccatcccagg agtggccatc ataccagcgt cagtgatccc agcctcatac ctttgccttg 360
agactctgca ttctgttgct tgttgatggt cactttgttc atataaatgt actcctcatc 420
agagcctgca gaaggaagga gacacaggct ttgtgtgact tcctgaagag aaagggcctc 480
cactaaaaac cctgttactc caa 503

<210> 451
<211> 215
<212> DNA
<213> Homo sapiens

<400> 451
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tactcgggaa actgaggcac aatcgcttga gccctggagt tccaagccgt agtgggcaat 120
gattgtgcct aagaatagcc actgtgctcc agcctggaaa acatagcaag acaaaaaaag 180
aaagagaaag aaagaaaaaa aagaaagaaa gaaag 215

<210> 452
<211> 418
<212> DNA
<213> Homo sapiens

<400> 452
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accagctgtc atggactgat ttgtgtctct ccaaattcat atgttgaata cttaacctgc 120
cntgccaatt gntaatggga gataattcct ttagggaagc aatgaaggtt aaatgaggcn 180
ttngtgggag cttaatccaa tgggactggg gtccctncca gaagaggaag acaccagagc 240
tctctgtctc cacacacaga gaaaagaggc tgtatgagga cacaagagaa ggtaatagct 300

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gtctacaaac caagaagaga agcctctcca gaaaatgaac cctgctggaa cttggtcttg     360
gactttccag cctccanaac tgggagaaaa taaagttcaa aataaaagtc tgttgtgt      418

      <210> 453
      <211> 196
      <212> DNA
      <213> Homo sapiens

      <400> 453
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aaaagtggat tcatgtggag cagacttgaa cccagactca actttacagc caactacagc     120
caacccgcag cttggaacgg aggcaggcaa gctagtccgt ggacccataa gtgataaaaa     180
caaatgcttt cattat                                                     196

      <210> 454
      <211> 137
      <212> DNA
      <213> Homo sapiens

      <400> 454
gttatgtaaa gaggtgcctg cttctccttc accttccacc atgatcatca gcttcctgag      60
gcctccccag aagccactat gcttcctgca cagcctgtgg aactgtgagc cagttaaacc     120
tttgttcttt attaatt                                                    137

      <210> 455
      <211> 430
      <212> DNA
      <213> Homo sapiens

      <400> 455
ctcagccgaa tcgtcacttc ctctggggac cctgtcctga cccccatgac cgtggctgcc      60
tgtggaaggt gctggtaaac atcctgttct ttcccctcct ggcgctttcc gtgcctgtgg     120
ctcttcccca gtctggagta cagtagggtg ttcttggctc actgaaacct ctacctcctg     180
ggtttaagca attctcctgc ctcagccaca tggagtattg ctctgtggcc caggctggag     240
tacaatggcg cgatcttggt tcacagtaac ttccgcctcc tgggttcaag tgattctcct     300
gcctcagctt cccaattctg gaggctggaa gtccacgatc aaggngccaa gcatggtcag     360
tttcttgncc tngcttcata aggccgcccc aattttgcca tcttcacaaa naanaagggg     420
tactcacgtg                                                            430

      <210> 456
      <211> 211
      <212> DNA
      <213> Homo sapiens

      <400> 456
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attatctcca agagcatgtt ctgataagag tccatcaaca tgaagccaaa actcattcag     120
agcatcaaga gaggaaagtt tctagtgatg gtttggtcat ggtctctttc aggatgattg     180
catggcagag gaaggaataa aactgtgaaa g                                    211

      <210> 457
      <211> 424
      <212> DNA
      <213> Homo sapiens

      <400> 457
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tgggctgtaa gcatgtcctg tgggatctgc atcttcagat catcctgaag tactcaacaa     120
ccacatcttc ttccaggaac agagcccaac ataaactggt agggtttgct gtcttagaca     180
gctaagagaa cgaggagtgg agctagtgaa caagcagtga agggggcagt tccttaatgc     240
cacccgaact gaatttcaac agtctgacaa gctagcgttt tgggtaaata tcccagtata     300
cttgtcacag agttaagtaa aatggacttc cttcaaagga agtgctttta atacaataac     360
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tgnttttggt ttttttancc atgggattaa aaatttacac atttactaaa tctggcatat     420
ttat                                                                  424

      <210> 458
      <211> 190
      <212> DNA
      <213> Homo sapiens

      <400> 458
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ccaagctggt actggcaaag acaatgataa ttctcgtgag aaaggtaatc ttggtgtggt     120
gaagagggtt tgcatggaat cagaagaatg ggcaaaggtt cctctgcaag atattggaaa     180
gaagacgaag                                                            190

      <210> 459
      <211> 370
      <212> DNA
      <213> Homo sapiens

      <400> 459
tgcctgagaa taaccnnaac gtgctggagt acatcatgtt ctggttagat nacgggggac      60
taaccagaac agactgactc tgtccgaatc accccctggag acaggaaatt cttcaacact    120
ttagcccggn angtcatgct ctccagggta taaaacccaa ggccagcttc gggcacttga     180
agacaaggac tccatccacc caggcaactt tcccgagcct catgggagca actcctcatg     240
aatcccaggc ttctgttgct tttgctgcct atctataaga aataaatcca cttcatttaa     300
cctgcaaaaa aaaaaaggcc cgngnggcca attcagcttg gacttaacca ggcttgaact     360
ttggttaaaa                                                            370

      <210> 460
      <211> 161
      <212> DNA
      <213> Homo sapiens

      <400> 460
cccacattgt gaggaagatt ttacaacctt ccctttacag atgagaaggc taagcaagag      60
aggttacata atgctcctga agttccacgg ctgttacttc acactctatt gcttcttaaa     120
ccaggatgca ttttataata aataagtata tttggtgtga t                         161

      <210> 461
      <211> 425
      <212> DNA
      <213> Homo sapiens

      <400> 461
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ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct     120
taactgatga catggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc     180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt     240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga     300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcaaa     360
aaaaaaaagg ccaggggagg ccaattcnag cttnggactt aaccaggctg aacttgctca     420
aaagg                                                                 425

      <210> 462
      <211> 268
      <212> DNA
      <213> Homo sapiens

      <400> 462
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cagcttcccc ccttacctgc aagggatatg ttcacagatc tccagtggat gcctgaaact     120
atggatagta ctgaatccta tatatactgn ttttttctat acatataata aaaggttata     180
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aattacgcnc agtaagaaga ttaaaaactc aaaatatgag ttaaacncat atgcnatata 240
atatatgcaa taaaattgaa atactggc 268

<210> 463
<211> 287
<212> DNA
<213> Homo sapiens

<400> 463
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ctgtcttcac aaaccatcgt gcaaagcaga accaacggcc ttttgtctgc ttttagaaat 120
gtctgcaaga atccctccca cctgtcaagt tatggggatg aatatgtata aaatgcatca 180
tgtatgtgta cctgtagaaa acactggatt gggatgtgca gaggaaataa agcaaacagt 240
tttttaaaaa nncaaaaaaa aaggccaggg gggcccattc ccctttg 287

<210> 464
<211> 236
<212> DNA
<213> Homo sapiens

<400> 464
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agaagtgatg cggctgcaag ccaaggantg tgaagaatgg ccagccacca ctggaagcta 120
ggggagacgc cagcacagat tctccctgag agtatccaga agaaaccaac cctccaacac 180
ctggatttca gacttctgac cttgagaagt gtgagccaat aaaacaactg cagtgg 236

<210> 465
<211> 283
<212> DNA
<213> Homo sapiens

<400> 465
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cgaatggctt tggaagttag cctttgctgc agacttgaaa atgtttcttc ataaactcac 120
cctaacattg caaggtcaaa tagcactaca tgagaaattt atacttcagt gaagacattt 180
tgacaaaaac taacattgtt taaatcacca gtaatgttaa gctgctttat acatgtccca 240
ttctgtcaaa ggttaaaata aagagcaaga tcttcattcc tac 283

<210> 466
<211> 256
<212> DNA
<213> Homo sapiens

<400> 466
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tggagtgatt caaggaagaa gccaccgagc caaggaatgc aggtggccac taggagctga 120
aaaatgcaag ggaaccgatg atcccctcag agcctctgaa ggagccaccc ctgcccatac 180
cttgacttta gcccagtgaa actggttctg aatttctgac ctttagatct gtaagataat 240
gaacttgtgt tgtttt 256

<210> 467
<211> 457
<212> DNA
<213> Homo sapiens

<400> 467
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ctgaactcct gcttggggca aagttgccaa aaaagacttc gttatataac aacaccagag 180
gagagcaaaa gacttctaga ctttgggggc tatttaaatt ctggtggagt ctcgctctgt 240
catccaggct ggagtgcagt ggggtgatct cagctgactg taacctttgc ctctcaggtg 300
tcaggcctct gagcccaagc taagccatca tatccctgtg acctgcacgt atncatncnc 360

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anaggcccgg accaattgaa aaattcncaa aaaaagngaa aanggccagt tcctgcctta     420
actgatgaca ttaccttgng aaattccttc tcctggc                              457

      <210> 468
      <211> 290
      <212> DNA
      <213> Homo sapiens

      <400> 468
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accagccgcc cttgtctnga ggcagnttca tacaccaccc agganccccc angatctcat     120
gaatatgccg gcactgaaag ttgtagcaag aagacagncc nggccactaa aagagggagg     180
ngatcgtgct ggccaaggtt atcggaaatc tgggagatgc agatacctgg agtttccttt     240
gctctttcgt gtcatattca aataaaaatn aaagttttct tcagtccttt                290

      <210> 469
      <211> 435
      <212> DNA
      <213> Homo sapiens

      <400> 469
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ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct     120
taactgatga catggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc     180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt     240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga     300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgntcaca     360
aaaaaaaaaa ggggccgggn ggggccattt aantttggga nttaaccagg tngaacttgt     420
tnaaaagggg ggggc                                                      435

      <210> 470
      <211> 191
      <212> DNA
      <213> Homo sapiens

      <400> 470
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aacacaccat catctgcctc tctccaaagg acgggggaga cgcctcatgt gagatggaaa     120
ttaagcctca gaagcagtca tttttcttta tattgtttgg aattaaaaac atattaaatt     180
gatccattat g                                                          191

      <210> 471
      <211> 307
      <212> DNA
      <213> Homo sapiens

      <400> 471
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ttacggatac catcacaaag aatttctaag gaaaaaaagg agaaaagaca gacatacctc     120
ccggcgcacc atactacatt ctgactggtc cagaagaatg ttcaccacag ttccccagag     180
cccaccggaa atgttctgac aactgtttgc taaggccaca cagcccgttt caagggtggt     240
cagtgctgat cctaatccca gtgaagtgaa tctcacctgt tcaaattaaa gagaaagttg     300
ttgaatc                                                               307

      <210> 472
      <211> 593
      <212> DNA
      <213> Homo sapiens

      <400> 472
caaaanctcc gggtnagaan tgaccctggc aanatctggc aaacttgtcc atcntattga      60
ccgcggataa cttctttgct ttcatatcct gggaatctct tgctttgggt cttgcgaact     120
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tcctggtttc ttgcattcct ttgcgcttgc acccccttggg accattaaaa aagaagaaag 180
ggaaccgggg aaggtaagng gaatcttgga aaggggacca acttggcacc cccaaaacaa 240
ggggaaattc ttgaagccac ccaagcaanc cacgcccagg tgggttaagc ccttaagccc 300
ggtgcccatg ttaagacgct cctggtgggc cgtaangcac ccgttaagct atgggtaagc 360
tccatggggg atcattgttg ggcatccacc ctatattggc aagtttctga aaatgataac 420
catttttaga aaatggatgg gaccaaaatg ggatgccaag ggtttaaaga aaanaaggtg 480
tttaataaaa aggggcaaac ancgganggn nccttccaag ggggnttgaa aaactnggtt 540
taaanaaacc ttnccctgtg ggtnaagggn gggatancnc cgaaatcttt act 593

<210> 473
<211> 676
<212> DNA
<213> Homo sapiens

<400> 473
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nntagnntat tcctncnccc ttggcntttg aattccactt ggtggtcaaa aagggcttnt 120
gnaagccctt tcantgggng angaacaaat taatttggtg gaatngccca ttcaaccnac 180
ccgaagcctt tttgcaacct tattgaacgg gtgggggggg aatttggctt ggcacccttc 240
ccccaggtgg aaagaaccca aaaaaagggg tcacccccat ttcccttaat ggtccttggt 300
ggaaccctta acaaaggggt ggaacttggt ggctttggtn cggggaaccc ccaagggccc 360
caaagaaacc acaggcccgg gaaaaggaac cttcccgggg gggattacca agcccattgg 420
gcttaaaggg aaaggggaca aaaggaaagg tttggtcaaa aggaaatttt cccaaacgcc 480
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tttcaaacng ggaaatnggg gcttnttncc ncacccccang gggaattccc tttaancacc 600
cccaaacccg ggcctggcct ttttaaattt tttacccccca ggggaanggg acttcaccat 660
ttggggggcc ggaaat 676

<210> 474
<211> 421
<212> DNA
<213> Homo sapiens

<400> 474
cagaaactna ancacatntg tgaannctng gggaaactta caatcatggc ncangatnaa 60
ggaaanccaa gcacctctta ccatggnttg atgaggaaag aaagaaagcg aagggggagc 120
tgccacacac ttttaaaacc atcatatntc atgagaactc actcactatc acaanangag 180
cangggggaa atctgccttc atgatncaac cacctcccac cangcccttn tcccaacatg 240
gggggattac aattcgacat ganatntggg tggggacaca ganccnnacc atatcacaat 300
ccaatgtggg tgatagctgc tacagnaact gtantanact tgnnagatat taactgtcat 360
tgtcttgcaa atggaggctc nctncaaaag attaatatgc ancaatgggt gaaccacaca 420
g 421

<210> 475
<211> 249
<212> DNA
<213> Homo sapiens

<400> 475
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ctaacgtgcc accacctgca cttcagtgtc tcaaggtctc ccctgccgct gacatttgga 120
acaggctggt caggatactg aggatgctgg actctccttc gcagtggtct ttgtataaac 180
ccaaggggaa tgggaatttg gagacaaagg aagccatcct ggagcggcca aataaagcct 240
ttaatcttt 249

<210> 476
<211> 452
<212> DNA
<213> Homo sapiens

<400> 476
gctggaangc tcntggagtg tgagcagaga ggaagagtgc ccagggacta caggaattta 60

atcaacttga gcaatcagac tgttttacat cctcccagct gacagccggt tttcccccaa 120
attctgtgtg gaatgcagcc acatcgtcta ttgaaaccag ctcctgacag accccaacaa 180
cttatacatg aacctaagtg aactatcctc agttccatgc taaattctcc accgtgggag 240
gggctacagc ttcattagca taacatgaga cccgtgttgc tggcaggatg actcactaca 300
tctgcacaaa tggggcctgt cctctatatg cgatgatcca ccctttcctc tctcaccccc 360
ataaaaccct cctgtcgctt ccttggggag acaccgcttt ggagaacact tgtagtgctc 420
tccttacttg tgacaagtaa taaaactcct ag 452

<210> 477
<211> 276
<212> DNA
<213> Homo sapiens

<400> 477
ncctncatta agnnngaact gncatngngt gtnacncatt agnatgagtn cacaattaaa 60
catgaactgg ttcctgccga aatgcaaaan aaacatgtca ntactaagct gctattttat 120
ttgacagctc attttccttt ttccctgcag tcatttgttg tttataagca aacctgagcc 180
tccaaaacac ccccaaaagt gcacacaagg agtcccataa tcagtttctg actttggccc 240
taaatcgatt agaatacatc tgatctgctt caaatc 276

<210> 478
<211> 300
<212> DNA
<213> Homo sapiens

<400> 478
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agcccagacg ctccaaggac cccattggca gagctgcgac cagagaccac tgctctgcaa 120
gccacgattg ctgtccgggc agtctcaccc acggggcaga ctgaatcctt ancttgctgg 180
tttgtgtcat catccggcat caggctcagt tcaaatncca gctcctccac ttccaagttg 240
ttggctttga gcaagtcact taatgtcgct gcgttccatg ccccatctgt gaaatgaatg 300

<210> 479
<211> 432
<212> DNA
<213> Homo sapiens

<400> 479
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tntgtggcaa anttaccntc gnatgcaggn atncaatggc cattcagccg gggcagttcc 120
agcnttcggg ggacaggagc cccaccccan ttttgtntcc caccacntcg tgtggcgcta 180
atcagganag gacagcgcca tctgccaatc ccctgggctc tgacaccctt taaggtgtag 240
cgcacacagc ctcaggagcc gccatgacaa ctgaagatgc tacacgaagg ccaggggatg 300
ctgccatgtc ccccangcag gtgccccgca gcctgtggcc ccacgccatg gtccagtgtg 360
ggggggaaca ccnttgattt ttaataaaga gancagaaga ccctggctgg gtctntnacc 420
actggcactt ct 432

<210> 480
<211> 441
<212> DNA
<213> Homo sapiens

<400> 480
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gggtctctaa atcactgtaa gataatcaac tgcttgggaa aacctatttg gattttaagt 120
gaacatgaaa taaactacta gcctgactca gctctcaatt gactggggat gccattcaag 180
aggagatgaa gaagtctgtc ttctgaattc tgacctgatg tctacatact taacaatctg 240
gcaggatata atattctcgg gtcacacctt ctttcagaac ttgcagacac tgcattattt 300
cttttggcac tgaattcaac tgggagaagt ctgnggccag ccaaatgttt aaccatttga 360
aaggacttcc ttttttgcct aggttttcca ttttcttttt angaactctc ttttttaatc 420
actaaacttt tatttaaata c 441

<210> 481
<211> 304
<212> DNA
<213> Homo sapiens

<400> 481
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tccacctccg ggttcaagc gattcttctg cctcagcctc ccgagtagct gtgactacag 120
agatgggtct cgccacgttg ctcaggtggc cttgaactcc tggacttaaa taaatcctca 180
tatctcaact tcctgaacag cttggactac acatgtgtgc caccatgccc agttattaac 240
ataattttaa aataacatct cctgttctac tataaaagta agtggaataa aaggtcagaa 300
aaat 304

<210> 482
<211> 423
<212> DNA
<213> Homo sapiens

<400> 482
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ccaggcatgg tggctcacac ctgtaatccc agcactttgg gatgccgagg cagctggatc 120
acttgtggtc aagagttcaa gaccagattg ggcgacatga tgaaaccccg tctctactac 180
aaatacgaaa attagccatt gtggtggcac acgcctgtaa tcccagctac tcaggaggct 240
gatgtgggag aactgaaccc tggaggtggg gattgcagtg agccaagatg gcgctactgt 300
gctccagcct gggcaacaaa gcaacactat gttttaaata aataaataag tgctgagatc 360
tcagaaaatt nnnnnnnnnn nnnnnnnnnn naacccnaaa aaanggggcc gggggcccca 420
ttt 423

<210> 483
<211> 402
<212> DNA
<213> Homo sapiens

<400> 483
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gggtcnngcc ntgtncnttg naggaaggna tgctgcncan aggccaaaac aaatntcgac 120
agtccttgct gggttccctc actcagtcta gagtatcact atgagatcat acctttttggt 180
ccaagcatat ttctacatgg ttatcaatca tgcctatcca aggaagtttt cataaaaggc 240
ctacgaggac atgatttgga gggctttcag atagaggttc ctggaggatg ccactcccag 300
ggagggcatg gagcttccag gccccttccc ccatacctgg ccctgtgcat ctcttcatct 360
ttattcatta taatatcctt tgtaataaac cagtaaatgt gt 402

<210> 484
<211> 497
<212> DNA
<213> Homo sapiens

<400> 484
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cagtcatcca cctgttccac ctgtttcaac aggtgaactc actgcaggca cagaagacat 120
ctaaggactt tagaagtgag gtagcctccc aggacaccaa gacacctccc ccaagaaatg 180
actccatttg tacattttca tataatgttc tttctacaag aggatctttg taatttacta 240
gaccctttttc tttctcaaaa tacatgagga taccagagga attatcttct aaccctcatt 300
ttgacccttt cacctacaaa cttgattgga tctgcctaat ctctgaggaa cttgctaagc 360
tctggttgtc aatttatatg gccagattga cagaaagtat gaaagtcctg tggaactatg 420
tttactttca cacatgaacc agtganggaa gccagttcat ctggtgatgc acattgatgg 480
ctcttcttgg tcccccaa 497

<210> 485
<211> 526
<212> DNA
<213> Homo sapiens

<400> 485
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aaaagccagg taatggatac caccaggaga ggttgactgg atacaccata tctcttcact 120
cactcaaaga cccaaactga tggagaagta aacatcccta ccagtcacag tggcagaagg 180
aaagaaagct ttgaagtgtc ttcaactgga aatcaaattc tccatcctag aagagacgat 240
cattatttcc ttaatgatta attatttaca acttgnggac ccggaagtca ttatatgacc 300
taccccaatc accagggact ttgtagtata attttaccac atctggaatg cagacaggcc 360
taatatattg gccaaaaaaa tcaagaacta ctttgatcaa gcntaaanta aaaggtggtt 420
ttaaggaaaa gttannnnnn nnnnnnnnnn nnnnnnnngg gggcngnggg gcccnttnng 480
ttgggattaa cccgggttaa ntttttttnaa angggggggc cccccc 526

<210> 486
<211> 513
<212> DNA
<213> Homo sapiens

<400> 486
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cacgacgtat caggcttttc atgtgtcatt gggtgaaagg gagtcacatg ggccaaggag 120
gggaagcagg tgtcatcaga gcagttccac agccctctag gcacagtaac aggcatgctt 180
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atgatcctgt agtccaagaa tgttggttct gagctctgaa ctaaggaatc tgggagctgc 360
caacccaaaa ggttactcct tatctatgga gcataagtga acccctggcc catttcttgg 420
nacaacatgt gcngggnaac caaggccttt ttttttaact aagggggaag ggggnccggn 480
naaaggcccc caggaaaaag ggggcccggg ggg 513

<210> 487
<211> 436
<212> DNA
<213> Homo sapiens

<400> 487
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attacaggcg cgagccactg caactggccc attaaatttt taaccccgta cttgacggat 120
cagctgacac tacccagacc agtaatctgg ctcaaccagt cctgcgatcc cacccaggaa 180
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aagctccaac caatcagcac tccccacttc ctgagcccct acccgccaaa ttatctttca 300
aaactcggat cccctaatgc tcagcggaga ctgatttgag caataataaa actctggtct 360
cctgcaaaaa aaaaaagggc cggggggccn attnannttg ganttaaccn ggntnaactt 420
ggttaaaagg gggggg 436

<210> 488
<211> 90
<212> DNA
<213> Homo sapiens

<400> 488
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gtgactgctg atttgcctaa ccccacatgt 90

<210> 489
<211> 515
<212> DNA
<213> Homo sapiens

<400> 489
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gggaggccaa ggcgggagga tcacgaggtc aagagattga gaccatcctg gccaacatgg 120
tgaaactccg tctctactca ggaggctgag gcagaagaat tgcttgaacc tgggaggcag 180
aggttgcagt gagccaagat tgcaccacta cactccagcc tgggcaacag agtgagactc 240
catctcaatc aatcaataaa atcaacatat taaatgtcaa aatacttaag taaaaatgtt 300

ctacttgttc tatgtcactg aaagaatagt cataaaaatc cagtatgaaa gtttttaaca 360
gactacttta tttacattct attacttgat aagcagcact tgaataacca aatttatatt 420
atcccagaaa gttatggaca ctangtgctt caagaagttt gctgaattaa angacagatt 480
tacttattgg cttttggtta aaaattatgc aaaaa 515

<210> 490
<211> 528
<212> DNA
<213> Homo sapiens

<400> 490
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agaggcattc ttactattcc aaaacaagga aagggtaaaa ccaagatgtc aaaggccccg 120
ctggtgtgga ancaaatttc tgcctccacc agctggatgg ctgctacccc tgtacaggtc 180
cctaacactg gaacagggat caacccaagt gcttggggct caccatgtcc tcctccccag 240
ccaggacagc aagtggaaga cacaggcgag ctgaaagagg ctcactgtgt gcccagccct 300
aaccccctgc ctcattggca ccaggcaccc aggactcctc agaactcaga gccagggttt 360
gggcagcctc ctcgtagtgc tccttgaata ggatttatag gacttgcacc angagctttg 420
ggccattcca ggggacattg cttttggggg aaaaaaagga cccaatatgg gtatctaaga 480
actttgaagc atgtcgtcag aaatcggagc ttcanggaat tgggaaat 528

<210> 491
<211> 537
<212> DNA
<213> Homo sapiens

<400> 491
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agaagtggag atggcggcaa cctattatac ctggatatat ttggtataca aacaaagaga 120
ctcaatgatg aattgaacaa tgaatctgaa ggaaaaagga gaaagaaaac acaagtgtgc 180
aggtgtcaat tgtataccat catagtacca tcaaaagaag taggaaatag tggagatgaa 240
gcaggttgat atgatttggc tgcttcccca cccaaatctt accttgactt gtagttccca 300
taatccccac atgtgggggg aggaagcctt tangaggtga tttaatcatg ggtggttac 360
ccgcatgctg ttctcatgat aatgagtgag ttctcacaag atttaacgtc tttanaaagg 420
aactttttcc ccttttactt ggcacttctt ttttgctgtt ggcattgtga aanaangaca 480
tggttgcttc ttcctttccc ccttgattgg naagttcccg anaacctccc cagcctt 537

<210> 492
<211> 367
<212> DNA
<213> Homo sapiens

<400> 492
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gctgaggcca ggcatggtgg ctcacacctg taatcccagc actttgggat gccgaggcag 120
ctggatcact tgtggtcaag agttcaagac cagattgggc gacntggggn aaccccgtct 180
ttactacaat ccaaaattag ccattgtggt ggcacacgcc tgtaatccca gctactcagg 240
aggctgatgt gggagagctg aaccctggag gtggagattg cagtgagcca agatggcgct 300
actgtgctcc agcctgggca acaaagcaac actatgtttt aaataaataa atnagtgctg 360
agatctc 367

<210> 493
<211> 189
<212> DNA
<213> Homo sapiens

<400> 493
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actctctaat taaaaccaaa caattctgta gactcttcca taggaaatat attcatgagg 120
ctgatgctta tagaaagttt tatcttgtga gttattaaat aaaaatgcat tcaaatttca 180
agaactgtt 189

<210> 494
<211> 157
<212> DNA
<213> Homo sapiens

<400> 494
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cttacttatt tgtgaatttc cataacatct agtagagtgt tttccaccta attgggcgca 120
ataaatgttt attgaaaaaa taaagaaggc tatgggg 157

<210> 495
<211> 416
<212> DNA
<213> Homo sapiens

<400> 495
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agaacatatg aaacaatgtc ttcaaaacac tgaacatcag cgatggaagc aggaggcaga 120
gaaattctag gcagacaggg gcgggtcccc agtgaaacag caccttcaag tcaaagtagc 180
ctgaaacctg ctgcccaaga ccctggactc agtcagtaga ggagagaagc agcttgactg 240
gagagaagca acttgacttc agagggacag ctggacttca gaggaaagat agcttaactt 300
cagagggacg ctctgacttc agggaagatt acctgaccat cccatccccc ttttcagctt 360
ctntttttca cttggagact tcctttggtt aaataaaata atctgcctcc accatc 416

<210> 496
<211> 395
<212> DNA
<213> Homo sapiens

<400> 496
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acaggtctcc tacttctaga ctcatgtttt tgaggagatc cgtggatcag catctctcct 120
ggtcaggacc acagaggcct tccacccgct gtgtgaagcc tcgttggatg ccagcttcaa 180
aagcaaaagg tatgtcaatg ttccataaag agaggatcgt gactctcccc ctgtgcaagt 240
ctggagctgg agagcactct ttctgtggga tgcagtcacc ctgaaatgaa actctcttta 300
ntagctttta cttgagaaga tncccatatg ccctacctac ttatngtnat gcnctcttat 360
attaaaaaaa aaagttgggg agtttaaaag gacca 395

<210> 497
<211> 429
<212> DNA
<213> Homo sapiens

<400> 497
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ccacctcgac ttcctaaaga actgggatta caggcacaag cctgccccac tctgcaaccc 120
ggtgtagaga ccgctacatc aaaagcacat agtaggaggg aagaaaaaac ccacagagtt 180
acaataatga aagtctggag gcaaatagag tagaagtcta cttgaatagg tatccctccg 240
taggatagtt catcacatat tagaactaga aaggtccttg aagtttatat agtggctggg 300
ctaatctgtt agattttcaa agtccaccaa gatcagttaa acaattgctg agctaaagaa 360
aagaacttac cattcattgg agtttntttg ccatcccatg cagttattgg aaataaatat 420
ttgtatgct 429

<210> 498
<211> 345
<212> DNA
<213> Homo sapiens

<400> 498
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cccacgctca agcgattccc gtgcctcagc ctgcagagta gctgggatta caggctggga 120
ttaccaccac gccctgctaa tttctgcatt tttagtaaag acagggtttc atcgtgttgg 180

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ccaggctggt ctcgaactcc tggcctcagg cgatctgccc gccttggcct cccaaagtgc     240
tgggattaca cgtgtgagcc actgtgcctg gcctattcct gatgactctc cttgctctga     300
agtctgtact gtctgaaatt aatatagaga ctcctgcttt ctttt                     345

       <210> 499
       <211> 388
       <212> DNA
       <213> Homo sapiens

       <400> 499
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tggaccacga ggatctgaca gccttttgca aaggctcacc agccccgacc tcagcagagg     120
aaagacgact ccatgcttgg ctagcaaggg caacggtgcc accagcttca tatgtcccac     180
ctggcagggg gctcctaaca ggggtcagag cagtactgtg acctgaagct ctccctgctg     240
cctcttcttc gtgccccttt tttacccatc acagctattt cccctaatac atcttctgca     300
tgtgcttctt ggaggacctg agatgacact gagccagact gaatttttct tttttgccat     360
aatcagaatg gattaattaa gaattaaa                                        388

       <210> 500
       <211> 310
       <212> DNA
       <213> Homo sapiens

       <400> 500
gagaaagtca ttattcacag aagatgcatg cgaaaccgcc cttgcagaat tacgactgag      60
acgaccctgc acgtgatgca tcagctggca ccacccagat gcataaactg gctcatctga     120
tcttgtggcc cccacccagg aactgactca gcacaagaag acagctttga ctctctatga     180
tttcatctct gaccaatcag cactcctggc tcactggctt ccccacaccc accaagttat     240
ccttaaaaac tctgctccct gaatgtttgg atagaacgat ttgagtaata ataaaactca     300
ggtcttctgc                                                            310

       <210> 501
       <211> 455
       <212> DNA
       <213> Homo sapiens

       <400> 501
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ctagctgtga aagctaacac aggtctcagg tgttcttctt cctgcaagtg agggtggagg     360
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tcagtgcaac ctctgcctcc tgggttcaac ggattctcct gcctcacccct ccttagtagc    180
tgggattaca gcccgtctaa tttttgtatt ttttagtaga gaaggggggt ttcaccatgt     240
tgaccaggct ggtcttgaac ccctgacctc aagtgaacca cctgccttgg ccttccaaag     300
tgctgggatt acaggctaga gccactgtgc ctggcctaaa tttcatacta taccgcattt     360
accctctatt taatataata cacccaatta agggttt                              397

       <210> 503
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<212> DNA
<213> Homo sapiens

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ccacccaatg ccagcacata gtg 443

<210> 504
<211> 346
<212> DNA
<213> Homo sapiens

<400> 504
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ccaggctggt ctcgaactcc tggcctcagg cgatctgccc gccttggcct cccaaagtgc 240
tgggattaca cgtgtgagcc actgtgcctg gcctattcct gatgactctc cttgctctga 300
agtctgnact gtctgaaatt aatatagaga ctcctgcttt cttttg 346

<210> 505
<211> 444
<212> DNA
<213> Homo sapiens

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aaccangctg aactttgttt aaaa 444

<210> 506
<211> 401
<212> DNA
<213> Homo sapiens

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gattaaaagc tttattgctc acaaaaaaaa aaaggncngn gnggncaatt cagntnggac 360
ttaaccnggn tgaacttgnt naaaaggggg gggccaccca a 401

<210> 507
<211> 306
<212> DNA
<213> Homo sapiens

<400> 507
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ttatggtggc ttcatgtgca gcattgtgac ctatacctcg gagtttttct tataccagat     240
gaagcttgtt ctatagtctt cacaaggaca taacacttgt cataagtaaa tgtttctatt     300
ctcttg                                                                306

      &lt;210&gt; 508
      &lt;211&gt; 224
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 508
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tactgaaggg tgagggtgag gacaagagaa gggaaggtgg tggagatgat tattcaacag     120
tcaagactct gctagtacac aagacaccag aaatccggaa ggcctctccc tgccccgcca     180
aaacaggaga aaaaataaat ttctgaaaga ttttgatata tttt                      224

      &lt;210&gt; 509
      &lt;211&gt; 318
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 509
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tcagtccaag tccacaaaga attgaatgcc gccaacaact atgcaaggat gtaaatgaac     120
tattcttcac ttgagcctcg gaagggacca taaccctgac tgataactga taatagtttt     180
gtgagatcct gaaagcagag gatactcaga ctcctcattc acagaagctg tgagagaatt     240
catgtatatt gttttatgtc tctaattttg tggtaatatt gttatacttt aatggctaat     300
aaagctacca actcaccg                                                   318

      &lt;210&gt; 510
      &lt;211&gt; 133
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 510
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caaggaaaga ggatcatttt gaagccggga tatggagacc aacctgggca acaaagcaag     120
acctcatctc tac                                                        133

      &lt;210&gt; 511
      &lt;211&gt; 114
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 511
gatcacgtca gatgtttttt gnacccccna ttncagncac cagnttgaag acccctacag      60
aggntgggga ttggagacca acctgggcaa caaaagcaag acctcatctt ctac          114

      &lt;210&gt; 512
      &lt;211&gt; 409
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 512
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ttctttgaag aacaaggggc cttctttaaa ttttnaacaa antctcttgc ctttgttaca     360
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<210> 513
<211> 411
<212> DNA
<213> Homo sapiens

<400> 513
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cctncnnnnt gnnaatnaan catgggtnnn gttntgtnaa aaggggggggg g 411

<210> 514
<211> 165
<212> DNA
<213> Homo sapiens

<400> 514
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tataggttgc actgtggagc aaatatacca ggaggtcttg atttcctttt tctccctcac 120
catccgataa taaatccaag tggaatgcta ggaattggta aaaag 165

<210> 515
<211> 461
<212> DNA
<213> Homo sapiens

<400> 515
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cccatggctc ccaaagtgtg gtctatggac tcctaggggt ctacaagatc cttccagagg 240
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<210> 516
<211> 475
<212> DNA
<213> Homo sapiens

<400> 516
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<210> 517
<211> 371
<212> DNA
<213> Homo sapiens

<400> 517
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aacagggaaa cttggaccca gagacatact cagaggaaga acgctgtgtg aaggcggagg 180
cagaggtcaa ggggattcat ctatgagcca cagactgcca cagactgcca gccaaccctc 240
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<211> 216
<212> DNA
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<400> 518
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tatttaagag agattttaaa taaaatctag taaatg 216

<210> 519
<211> 483
<212> DNA
<213> Homo sapiens

<400> 519
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<210> 520
<211> 233
<212> DNA
<213> Homo sapiens

<400> 520
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cctggtgaag aagcagaacc ctagattcac aaaataaaca gtcatctaca ggc 233

<210> 521
<211> 366
<212> DNA
<213> Homo sapiens

<400> 521
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tcagccttcc aaagtgctgg gattataggc gtgagccact gcgcccggcc tatcattgct 300
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atggac 366

<210> 522
<211> 368
<212> DNA
<213> Homo sapiens

<400> 522
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taatcggt 368

<210> 523
<211> 487
<212> DNA
<213> Homo sapiens

<400> 523
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ggaaatt 487

<210> 524
<211> 325
<212> DNA
<213> Homo sapiens

<400> 524
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<211> 495
<212> DNA
<213> Homo sapiens

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<210> 526
<211> 355
<212> DNA
<213> Homo sapiens

<400> 526
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<213> Homo sapiens

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<210> 528
<211> 510
<212> DNA
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gttccaaacc ttccanacat tgggatttaa 510

<210> 529
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<212> DNA
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<210> 530
<211> 513
<212> DNA
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<210> 531
<211> 501
<212> DNA
<213> Homo sapiens

<400> 531
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agttggagac cactattcta agtgaagtaa ctcaggaatg gaaacccaaa tatcatatgg 360
gagctaagct atgaggatgc aaagggataa gaacggtata atgaaccttg gggacttaaa 420
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<211> 375
<212> DNA
<213> Homo sapiens

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cacaatcata taaggcaaaa cttgccatgt ttggagtgga gcagagcttg gaaggcccgt 180
acaaataagg gcatgtaaca cccttccaga cagcaaggat tttaaatgga ngatccctaa 240
atggccccga aagaacttca cccttggnta ggaaggcttc aaccatttcc cccaccctta 300
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<211> 599
<212> DNA
<213> Homo sapiens

<400> 534
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ggaaaagnaa gccaaagggg cctttttatt ttggaaaatt ggaaggggaa aaaccaaggt 180

nggaaggcct tcccgcgggg attttaattc cgganaaaag nggggtccac cttggggatt 240
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gnaccaattc ccaccccggg gaatttnggg ggaagaccaa aaaaaatagn ttggnttggc 360
caatttttgg gaccaaaaac cggtttaacc tttccaaggg aaaaggaaat tttaattggg 420
tttttgcccc caaccccca ttnaatttgg gaatttttna attccnaaag gnccnccaac 480
cccaaattgg ggccctttttt aanttccccc ccctttgggt tgcccaanaa ggggaaaatt 540
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<210> 535
<211> 381
<212> DNA
<213> Homo sapiens

<400> 535
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aaggttggat ggccccaacc accaccacgn aaggaaaaaa aaggaaaaac cggaaggaag 180
gaaggaaana aggccacgga aggaaggacc acgcaaggac cagnaaggaa ggaaggccgg 240
aaggccattt tcttggaaaa gggcgccaag gccttccccc cttttctccc ccttggttgg 300
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<210> 536
<211> 630
<212> DNA
<213> Homo sapiens

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ttcctttaaa ccccctnaaa aaaggggaaa aaaggcctnt tttggaaagg ggggcccana 180
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ggttttttttt gggtgttttt ttgggccaag gnaacctttt tttttttttgg ccaatttaac 540
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<210> 537
<211> 258
<212> DNA
<213> Homo sapiens

<400> 537
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aatgaagtca ttcctgcaaa agaagctgtg agaggaaata cagatgcagt ggctgaatat 180
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<210> 538
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<212> DNA
<213> Homo sapiens

<400> 538
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atttttcctt ccaaaccaat tttgggaaaa ccccaatttt gggggatttn cccacaattt 180
aagggaaaaa aaatttggtt tanaaaaggg ggccccacaa ggaacccccc ncgggggaat 240

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ctttttccat ttccaaattg ggtggggggt tggggaaggg aaanattttt ccaatttggg      540
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nccnttttta atttgggccc ccnctttttg ggcncccccc caaaaaaaaa aggnaaaaaa      660
ttaaatttgg gncccnnttt tttnccnccg ggaaaaaaaa gggnaaaaaa ggnaaatttt      720
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<211> 240
<212> DNA
<213> Homo sapiens

<400> 539
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caggatggca gagcagtgag ctggaaggag tctggctcct tgagaaggat ggagccccca      120
caccacaagt cccggactgn ctgctttact attcagcctt aacaaagaag gaaatcctgc      180
cattggcaac aatgtggatg aacctggagg acactgtgct aaataaaata agccaaacac      240

<210> 540
<211> 516
<212> DNA
<213> Homo sapiens

<400> 540
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ggntcntcaa acgcnaggac tactatgctc gccacccatc caaatcgctt gcgcgtaaga      180
gggtaatttc ctagagcgta agctnancca ttnancattg gctacacacc acaaancgcc      240
acccggnggg gtgatanaat tttttggnca attaanattg gacttngggn aggaatgnnc      300
anctagctct tttacaatta aaaattggtt ttaggacctc caaatgggcg tgaaagtaaa      360
tatanaaaaa cgttggcctt ggggggggcat actaaaaaat ttgccctttc gcaatctcat      420
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acaccaacgg cgacccaatt ttgggaaggc cccctc                                516

<210> 541
<211> 271
<212> DNA
<213> Homo sapiens

<400> 541
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tattcctaat tctcatccat aactgaaaag gttaacattt caaatgggat tacagaatag      120
tgatgtcact ttcctatatt catataccaa gtcaatgttt aaaaatagct tatgttcagg      180
agaatggcgt gaacccggga ggtggagctt gcagtgagct gagatcgcac cactgcactc      240
cagcctgggc gacagagcga gactccatct c                                     271

<210> 542
<211> 331
<212> DNA
<213> Homo sapiens

<400> 542
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gtgggctatg catcttacct gcttgagcaa gagaagaaca aaggatatct acctggacag      120
gtgagaattt atatcattga aagcttcatc ttgattcact gagtgtcatc attcatgctg      180
cattcagaag aggtgattca aatctccaga ataaagtgtc atcatcaatc tcacatattg      240
gtatgctcga atagacagca tttaccatcc tccctaatgt ggaaagaaaa ataaaaaatg      300
agtactaacc atttgctttt tgtgttaaaa a                                     331
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<210> 543
<211> 111
<212> DNA
<213> Homo sapiens

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tcagggatac tggcctgtga gtttcagcac cgactttctg gaactgtaaa g 111

<210> 544
<211> 378
<212> DNA
<213> Homo sapiens

<400> 544
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tcttgtgtgt ccagctggag tngcaatggg cngcngatac tcagnntcac ntgcaacctt 240
ctgcctccct ggggtttcaa gtgatttctc ctgccttacc ctccctgnag ttaagcctgg 300
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ggcaattttt ttttaaga 378

<210> 545
<211> 110
<212> DNA
<213> Homo sapiens

<400> 545
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<210> 546
<211> 70
<212> DNA
<213> Homo sapiens

<400> 546
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aacgctaagg 70

<210> 547
<211> 181
<212> DNA
<213> Homo sapiens

<400> 547
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gagggatggc ttgatggtgg gacttcagga gaagaatacc ttcctgctcc atcccctttc 120
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c 181

<210> 548
<211> 342
<212> DNA
<213> Homo sapiens

<400> 548
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gccatcgcat cccccgtgac ttgcacgtat accgcccaga tggcctgaag taactgaaga 120
atcacaaaat aagtgaatat gccctgcccc accttaactg atgacattcc accacaaaag 180
aagtgtaaat ggccagtcct tgccttagct gatgacatta tcttgtgaga gtccttttcc 240

tgggcttcat cctggctcaa aaaagcaccc ccactggagc atctttgcga nccccacttc 300
tggcccgnca ganaacaaac ccccctttg actggaaatt tc 342

<210> 549
<211> 267
<212> DNA
<213> Homo sapiens

<400> 549
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aaaaaaggga acctttttaaa aaggcctttg ggaattttcc ccccaacccg ggaaaaaaag 120
gcccaaggtt ccaaaaggna attggcccaa ggggggggaa anggcaaaag gnggttgant 180
ttttggggaa gnaaaaaccc ttttaacccg caaccttggg ccccccccttt ggcccaaaaa 240
aaaattaatt nggtttcccc cttcggg 267

<210> 550
<211> 331
<212> DNA
<213> Homo sapiens

<400> 550
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acaggcttgt ctcaaactcc tgacctcatg atccgcctgc ctcggcctcc caaagtgctg 180
ggattacagg catgagccac catgccccgc ctatctagca ccttttaaaa gtctgaatgg 240
gaaacatttg ccacctattg cctctaaggg tggccaccta tgagacttca tctacattaa 300
taaaactaca tacaatttat ctacataata a 331

<210> 551
<211> 330
<212> DNA
<213> Homo sapiens

<400> 551
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gacaagattg tctttaagga aacagaagac tgagaagaaa agaagcttgc tcaaggtcac 180
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agcaaaatct gatccagaga ctgtggatgc tggaggagcc gtcaaggctg ggaaagtaa 300
acatgcactt gtgttcgcaa tcaacagaaa 330

<210> 552
<211> 330
<212> DNA
<213> Homo sapiens

<400> 552
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aagcattttt gaaggtattg agggagttct 330

<210> 553
<211> 338
<212> DNA
<213> Homo sapiens

<400> 553
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tgaattctct gtgtgatccc aagtaccaga acagccgccc agcaggggct ctggaaatgt 240
gccctgaaag aactcagaca acaggagacc ctccttcagc ttncagggct tgctggccat 300
ttgcacacag aagggagcag ccttgtggtt tcaaaggg 338

<210> 554
<211> 237
<212> DNA
<213> Homo sapiens

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gagactccga ctcaaacaac aacaacaaca acaactctca tctttttgcc tataaggaat 180
tattcttggc ctctgttgta caacttcaag taaaaggacc taacctactt agaaggg 237

<210> 555
<211> 331
<212> DNA
<213> Homo sapiens

<400> 555
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tggttgaaga aacattgtcc gaatcagtat cagatctaca gtgagtcatt caaacagcat 120
gacataactg ggcgagccct gctgagactt actgacaaaa agctcgagcg aatggggatt 180
gcccaggaga acctccggca gcacatctta caacaggtgc tccagctgaa ggtgcgagaa 240
gaagtcagaa atctacagtt actcacacaa gcattattct gaggggttct tccattaaac 300
accggntagc cnttccaagc tgcttgtcct g 331

<210> 556
<211> 218
<212> DNA
<213> Homo sapiens

<400> 556
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caattggcca aattcttttc agtgttaaaa tgctgtaaaa tataaaacgt atgtaatttc 180
ttgacaaaaa ataatactat ttcaggtttg actctttt 218

<210> 557
<211> 330
<212> DNA
<213> Homo sapiens

<400> 557
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tgtaaaacac gcagcgggcg gcacatggga tgccggatgc caagctgtgt gcatgggaca 180
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tggacaatgg aaccgtgcat tgtgagtcca tgtgatgaac cagcgcatcg ggagccacnt 300
gggtccttcc cttcacccgt catcagtcag 330

<210> 558
<211> 172
<212> DNA
<213> Homo sapiens

<400> 558
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ccttcagaca agcaccctta cctgaatgct tgcagaataa acagactgcc tg 172

<210> 559
<211> 336
<212> DNA
<213> Homo sapiens

<400> 559
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catatatcaa tagcctcatt tggtttttat tgcatg 336

<210> 560
<211> 332
<212> DNA
<213> Homo sapiens

<400> 560
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cttgcagtga gctatgatca caccgctgtg ta 332

<210> 561
<211> 62
<212> DNA
<213> Homo sapiens

<400> 561
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tc 62

<210> 562
<211> 332
<212> DNA
<213> Homo sapiens

<400> 562
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tttcaacaat ggctttgctc ctcagtcacc tctctctgga aggatccctc aatggatgag 120
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gaagaagaga ggctgctcta tgtcctcctt ttgccccttc ccacacacag taagatgaag 300
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<210> 563
<211> 308
<212> DNA
<213> Homo sapiens

<400> 563
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ncgtcccctc tgaggacagc tctgaagacc agcttccttg acttgcactg tgagaccagt 180
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gggggtta 308

<210> 564

<211> 354
<212> DNA
<213> Homo sapiens

<400> 564
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caatgggaga aagtgaagga ctccagagcc cctggagatg gaggatggag gagcctgggt 120
tcttgnatcc tcacatggaa tgccagccac aaattggcat ttggactcct atatggacaa 180
ggaataaatt taaatcctat taaggctggg tgcagtggct catggctgta atcctactgc 240
ccttagaaga ccaaaagcag ggaagatcac ttgaggccca ggagtttcaa aaaccaagcc 300
ttggaccaac attaagtgag accccgtctc tacctaaata aataaataaa tcta 354

<210> 565
<211> 350
<212> DNA
<213> Homo sapiens

<400> 565
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aacagaaaac accgtctttc tttttgacta catctgtcct cagagatggt gctgatggat 180
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<210> 566
<211> 193
<212> DNA
<213> Homo sapiens

<400> 566
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tccaggcccc nccccgngtt cattnttgca aaatggactg ngcctcngac ntcctcnnaa 180
aatgttcaac ctt 193

<210> 567
<211> 310
<212> DNA
<213> Homo sapiens

<400> 567
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<210> 568
<211> 317
<212> DNA
<213> Homo sapiens

<400> 568
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caaaatatta ccccagttgc acaagtattg tggaattttg tgcattngnn ggnagacaac 180
tggttcttta tcttcttcca atgtcaaaag taaatttggt gattataact ttggcaatat 240
attttaagca gaattagtat attatgtaac atgttttatg aacatncctt attaaaattt 300
tgggttatgg actcctt 317

<210> 569
<211> 338
<212> DNA
<213> Homo sapiens

<400> 569
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cacagaactt caccattggg ctatgcatag tgctgcttta ttggtaaaac aggaagatcc 120
aatttacacc taaccctatt tcatgtttgg ccaacaatgt atccatggaa ggacccttca 180
tgtgagattc caactgcatt ctaaacactc agaggacatt ctgcatgccc tggggtgtaa 240
gcactgccat gagatgtaaa tcccttgtga agaacagcaa gtaggcagct tnaccttggg 300
cttcaccacc ttcatgaaga ctcctctgac caacgcct 338

<210> 570
<211> 464
<212> DNA
<213> Homo sapiens

<400> 570
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tgatgtcctt cacccccggg taaggcggac agtgcctaag acaagaaaat ttccggggaa 120
anaactngcc caaaaatngt tacaaaggac ccaccacccg gtatgntcat cttttgtatt 180
ttggggattt canaaanntc attttttttgg ntgngggggg gcnaaagnac aaaacnttgg 240
gctttttttgg gcnantgaat tttttattgg aatttccccc ntggggattt tatttgccca 300
naaaaggaaa aaaaaattgg aaancccccc aanaaaccat tntgaanctt ttggccaaag 360
aaanaattng ggcccntngt tttttgngat ggaaanggna aaaaaaaggg accccttncc 420
aatgtaaaaa aaggcccaan ccccgaaaaa ggggggaacc cgcc 464

<210> 571
<211> 358
<212> DNA
<213> Homo sapiens

<400> 571
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cctcctgggt tcaagcgatt atcctgcctc agccgcccca gtatctggga ttacagcagg 120
tacctgctac ttctcatgct tcattgtaag aacaagatct gggtccagct caacaaatac 180
ttgaacaaag aatgaagtaa gcagaccagt gtaaagagaa tgcctcatac aaagttcaga 240
ggcccaggag atagaagctg gtaaaaccat tcaccaagaa gccaagccgt ggaaaaaaag 300
gangggtgcc ccaccaggga aatgactgca tgcaaacaga gcttggttat agtggggc 358

<210> 572
<211> 348
<212> DNA
<213> Homo sapiens

<400> 572
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gactaacatc caaaggcata gaaattgaca gcnaatacnc aataaaacag gaactcccag 120
atcgaatgcc cacgtggaaa agtcatngag agagaaactg actcaaagca tccgctgtgt 180
tccggggcca tttgngnggg caggatgggg gttaccgagg agtgttntgg ggccatgagc 240
acgggcgngc gggtgatcct cacctcccaa ctggggtgcc ttcaaaaact ttagtaaacc 300
tccctgtgac tncgcttcct cgngaacacn gtggntgcgg gaggattc 348

<210> 573
<211> 360
<212> DNA
<213> Homo sapiens

<400> 573
ttcttcgtag actctggaat ggagctggaa gctgtcatcc tcagcacact aacgcaggaa 60
cagaaaacca agcactgcat gttcccactt ataagtgaga gctgaacgag cagaacacat 120

ggacatatga aggggaacaa cacactctgg ggcctgtgag gtgcagggag agcatcaaga 180
agaacagctg gtgggtgctg ggcttaatac ctgggtgatg ggttgatctt gtgcggcaaa 240
ccaccatggc acacatttac ctatgtaacn aaccttgaca tcctgcacat tgtaccccng 300
gactttaaaa ataaaagttg gncaaaaaga aaaccttaac ttacttttaa aaaaaaaggt 360

<210> 574
<211> 314
<212> DNA
<213> Homo sapiens

<400> 574
ggtgagaacc actacaggac aaaaatgagc tccttttttc cagtctcagc ccaggaggga 60
tcttcacaga gaaagcaagc ccagcccatc cccacagctg gctccctggt gcccattctg 120
aaaggctgga cccatcctga cctgtccctg ccccaaggac tgcctggtga gggatggctt 180
accaacactg tgactcagtc cttccaacat gcccaacagg tcaattctgg gatattcctt 240
acaggaatta atgagagcac attgccggta atgttggcat taataaaata acatttaaat 300
ttaaaaattc cttt 314

<210> 575
<211> 363
<212> DNA
<213> Homo sapiens

<400> 575
ctccccatta tggctccgca accaggtggc gctaaagaga gaccctggaa ggatgcggga 60
ggaagcggag acctgctgtg tgcttgctgt ggccctaagc ttggcagttg gaccctcagt 120
cggccccagt ctcccgctgt gtgtcacccc gtacttccag aaccagcctc atcttgcccc 180
tcagaggtac ctgctccagc ctggtgacac tccctccgaa caagttctaa tctcaccctc 240
ccatttgacc cccaagcccc aggggtacag gcttcctgat accttaaggg cctccctttc 300
tgcctttctg gtttttggta accagcaaac agttatttct attaaattct ctccatcatt 360
gtg 363

<210> 576
<211> 278
<212> DNA
<213> Homo sapiens

<400> 576
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gtttgaaagg agtctgggtt ggaggagagc tacaggcgga tcaggaacac ccatcttgga 120
tttgacctga gtgaaaaata aactgcaatc attatgttaa aacacttgca tatttggggg 180
gattttttgt ttatcttgtg aaaatgcnca ttaacctcta ttgtcataat aaaaatcctt 240
aaagttggtg ctaaaaataa acgcaatttt gaaaattc 278

<210> 577
<211> 85
<212> DNA
<213> Homo sapiens

<400> 577
aaacaccaac cattgaggtt gagaccattt ccagaggaag aagcatgggg ccatcattta 60
ttaaaattta tgaaatgttt tgcgt 85

<210> 578
<211> 320
<212> DNA
<213> Homo sapiens

<400> 578
ttcttcatct gctgactatg aaacgattct agattgtttg ccaactaaat gtgatgcttt 60
cccaatcaac tacggcaggc cagatggcac tttcacttct acgggctccc tctgtggtgg 120
gtaaacgtgc agagaagact ggaacactgt cttccaggag cctaggttac actgatccca 180

gcacagcact tcctaccaag taaagatcaa ttttaaaaat gaatgaagtc aactgaaaaa 240
gctcccaatg gccaaagctg gaacaatttg agcaaagaat aaaggtatgn tnggnttnta 300
ncccagaaga caaaataaat 320

<210> 579
<211> 652
<212> DNA
<213> Homo sapiens

<400> 579
aatagaggaa agccttcctt ccggaaaaga gcccctttcc ttcttggngc cncaagccng 60
ngaacaactt ccctaatnct ngcccatccc cttcaagcca atngcttaat ccaacttcaa 120
agcctttcct tcccaacaaa acaattcccc cttngcttca aagccaaaac ttaactgggg 180
tttttngtgg ggggccaaca accaagaaaa gngtggcccc caaaagcccc ccctngttgg 240
cggaagnaaa aaaggggttc cttgggccaa gcccccaaaag ttggcctttt ttggaccaat 300
tggccccaag tnggttcccc cttggggaat gggggggaagg aataaccccc aaacccacca 360
aattcccaac ccccccaagn gggaaggggt tgggggtaac caaaatttaa ccaaaaccct 420
tggggggggaa ggaaccttgg ggggggggaat tggaaacccc ggggtttttc ctttcccctt 480
ttttccccng ggnaaaggcc ntttttttccc cngggnaaaa nttgggggggc caatttgggt 540
tngggggggcn ttttttttttc cccccttgggn gggggaangg gggaaaaaaa cccttggggg 600
gggggggaaa aagnaaaaaa ccccccaang gggggggggg aaggaggatt gg 652

<210> 580
<211> 314
<212> DNA
<213> Homo sapiens

<400> 580
ggcaaggctg tgctttaatc atcttcgtaa cccaagtgct gatcagcgaa ccaaatacac 60
acagaaatac cttgcgccct ggttgctttt ctgtgctaga atcactccag acttcaatca 120
tcagcctgct acaagccact cccaagcctg ggacttaatc gccagcagaa agcacgtcca 180
cacgtcctct gttacctcct ctagatgcta aggaatgtga ctccaagaag attcaaatag 240
caggatccta cagcgttctg ccatcatctt attcaacaaa agtcttttgg tttnacaaan 300
acccattcat attt 314

<210> 581
<211> 328
<212> DNA
<213> Homo sapiens

<400> 581
actgagaaac cgangctcaa aaaggctgag gaatttgcct aagatcacac agagaaacgg 60
gaagctgttg gggccatgct gttggggcca gagcctacgt atgcactgcc tccagtgtgc 120
atggggagaa agcaacccac atcgactgct gcaatgagac agctgctttt cctgtgtttg 180
ggcaccgaat catctcatca gccccactgt gcaagttttc tcctctccat ctcaaagatg 240
tgggcaccga gcctcccatg gaataagtaa tttccctggg gtcacacaac ttanctaagn 300
ggcagcccct nggatccaaa ttgtaaag 328

<210> 582
<211> 324
<212> DNA
<213> Homo sapiens

<400> 582
ggtaaaacac cctcaaggat gggcactgca caagactgta acaacaagga acgtggcttt 60
gcatcctccc agcaacaaag tctaccacgg atcccacccc actctgattt cggctcagcc 120
gagaacttga aataacgggc ccactgcctc tgctccacga ggatccatgc catcatggca 180
ctttgggagg cctgtcacga gttacacagg cctaggctgc ccacacccca gctcagcaga 240
aaaagagaac tgcaatccaa gtcagacaga tcctgcctgg gcntttccgc aaaaagcctg 300
gagagtctga ccagcaaaga aaca 324

<210> 583

<211> 238
<212> DNA
<213> Homo sapiens

<400> 583
gttctgtttt aaaattcttc cagtgtccag ttgccaatgg gattaaaagg aaaacgatga 60
ggaaaaagtt atctgaggtc aatctgcaat ggaatatgtt cctttcctgc ctgcttagat 120
gtcttctgat agtcacgaat tgatttgtag tcatacttct gtaatatcta tatgcatgtg 180
aagcactgtc tgatgttaaa atataaacat catctatagt aataaactga gacactgc 238

<210> 584
<211> 427
<212> DNA
<213> Homo sapiens

<400> 584
gaactagaga gtggtgtaca caatccctag cagtactgac cctgcttgtt ggacttaacc 60
ctgaagtcac aggtaatgtt atttaggaaa agtatctctg caatacacat actcttttag 120
tacaggtagt aggagctagt taggcttaga gcagtcctac ctcttagcca tcagtacacc 180
aaccaagaac catctttacc ataggaagag gaaagaaaga gccaagagng naagcctagt 240
ctagagtcta gagtaggatt aatntaccaa gccatagggg attttattcc tagtagccac 300
caagttttcc tccaaaaagg aaatccaagt ttagngtngn ggaaaaggaa atttcaaatt 360
ttgnggctta ttttgcccca tttggtaaat tccaaccacc ttttttcccc aattttaatt 420
ctccaat 427

<210> 585
<211> 459
<212> DNA
<213> Homo sapiens

<400> 585
gtgggatgcc tccatgagct ccaacaggca gcctcgccgg cctcccagct ctgctcagtt 60
gctcagcacc ccatggagaa ggtgaagccc ataatgaaca cactgccctg gccacttact 120
tcctccaacc aaagaagccc tcatctcccg ggcctagacc atttccggag accagcttgt 180
gacagagcca caacctccgg tcactctgtc agctatctgc agttcctcct ttttcctttc 240
ctctctcccc tcataaacaa tgactgttga tgtttccact agctacagat gctgatgcca 300
agattagctt tggtcaagat gatattctcc atcctccaaa acaatgacca aaatgtttta 360
ttttatggct aggaacttta ctttctttca tatgaaatat ttaatgnatt tttcactgng 420
ctcatttttg ntttgngngg ggataggtaa tagcaaaac 459

<210> 586
<211> 433
<212> DNA
<213> Homo sapiens

<400> 586
gagatgggga aacgaatcca gaggttaatg atatgtccac cataactcaa ctatcaagat 60
cctcaagtca gtgctctttc cttcatgtcc tcaggagttc tccagggaca ctgtaaagat 120
gagaaggagg ttgcacggtc tgaatgtttg tgtccttcca aaattcacat gttaacactg 180
aatcctcaat gtgatagtgt taagaggtgg ggccgctggg aagggattag atcatgagga 240
cagagcccta atgactggga ttagtaccct tataaatgag gccccagaga gctgtccctt 300
ccaccatgtg aggattcagt gagaaggtgc tgctgatgaa ccagaaagca ggccctcatc 360
agagaaagga tttgccagca ccctgatctt ggactttcca gcctccagaa ccatagtaaa 420
tatacttctg ttg 433

<210> 587
<211> 525
<212> DNA
<213> Homo sapiens

<400> 587
ggtctctctn tgttgcccag gctggagtgc agtggtgcga tcatggctca ctacagcctc 60

gacctcctgg ttcaagtgat tctcccgcct cagcctccca agtagctggg acttcaggca 120
cacaccacca tgcctggcta atttctgcat tttttataga tacagggttt tgccgtgttg 180
cagactgatc tcaactcctg aactcaagcg atcctcttgc ctcagcctcc caaaccgctg 240
ggattacagg catgaaccac tgagcccagc tgcctttcac acttctactg tgcattagaa 300
tcacccaaag agcttgttaa gacagattcc caggctgcaa tcttggaggc ctactggctt 360
agtagctctg ggctgaggcc tgagaatatg cattcctaag aaacctcagg tgaggctgat 420
gctgctgtgt gtggactgct angctangac angggtttnt tttttcctaa aaaangggtt 480
aaattttttg accncaantt tnttataggg tatttttaaa aggga 525

<210> 588
<211> 524
<212> DNA
<213> Homo sapiens

<400> 588
atgtaattaa ggatcttgag atgagatcat cctggatgac ccaggtgggc cctaaatcca 60
atgagaagtg cccctataag agaaagacga ggagaagaca cagacgcaga gaaggcgacg 120
tgaaaatgga ggtggacatt gaagtgacgc agtcacaaac caaggaatac ctggagccac 180
tggaagctga aagatgcaag gaaggattct ctccttgagc ctttggagag aatccggctc 240
tgccgacacc ttgatatcgg gctgctggct tccaaaacat gagagcatat atttctgttg 300
ttttcagccc ccaagtttgt agggattggt tacagctgcc ccaggaacat aatacatgat 360
tgaagaccag cttttaatgt acaaacccta gtacaaggca ctgcaaacct cagagatctt 420
cacacaaaaa ngnnatttta accnctttaa aaggnnaaaa atcttttttc ccncccntnn 480
aaagggnttn ncccnaggnc cttgaggggt tataatataa gagg 524

<210> 589
<211> 551
<212> DNA
<213> Homo sapiens

<400> 589
atgcctggtc atcctcaacc tggtggacac gccttcattc actggagaag cagcagcagg 60
gcttgcttcg agtccaggga agcaagaaaa cagatctgat ccccctgtgg agtgtggagt 120
aggggcactg cccttgatgg tgggagtgaa accaacttgt ttgcagataa gattgccgag 180
acaattccaa tggggaaaag aagtctttcc aaacatgctg ctgggacaac tggatctcta 240
catgcaaaag aatgaacttg aactactatt tcacactata ttaaaacaat tatcaattat 300
tttgtgactg aaggcaatta agaagcagca aatggaaaaa gctctcgctg tcttcccctt 360
ttctgcctca aggnaggata taaattctcg tttactggac acaactctag actctattca 420
ccccnagaaa gcaccncaaa aatatnttna cnaacgcttt tnttttttt tcccccccca 480
ataangtttt tcccccantg gtttcccccc nnaaaggaaa agggcttcct ttggccnngc 540
attttttta a 551

<210> 590
<211> 500
<212> DNA
<213> Homo sapiens

<400> 590
gtgaaattca tcttagcttn tgggattggc tcctactcaa catgcaagca ctaatcctct 60
aacatgcaga gacagagtct cactctgttg ccaggctgga gtgcaataat gccatctcga 120
ctcgccgcaa cctccacctc ccgggttcca gtggttttcc tgcatcancc tcccaagtag 180
ctgggactac aggcacgtgc caccacgccc agctaatttt tgtattttta ggggggacag 240
agtttcacca tgttggccaa gatggtcttg atctcttgac cttgngatcc gcccacctca 300
gcttcccaaa gngntgggat tacaggcatg agccactgcg cccagcccat acataagaat 360
tttaagtcnc nncatgcctc cnttantnaa aaaaccttnt taggaaaaga gaatcagatt 420
ttttcgttgg agtgcttaca atggatgaat ccttttagca tcattatctc attttaattt 480
gcaagccaat ttttaagaaa 500

<210> 591
<211> 526
<212> DNA
<213> Homo sapiens

<400> 591
gaagtcagag attggaagca ccattgtttg cttcaggatg gagggggctt cctgacaagg 60
actgtggggg acctctagga gctgagagca gccccccacct gagaaccagc aagaaaatag 120
agaataagcc tggaagcaac ttttccccca aagcctccag acaagacctc agcctgacca 180
acgccttgac ttcagcttgg tgatatcctg ggcagagaac tgagccatgg cttgtcatgc 240
cagcattctg acctacacaa ctgtgagcca gtaaacaggt gaaccagtgc ttgattagct 300
acgtttcctg tttctgcatt ggtgatcatg gaaacaaatg ctgagaagga gcctctgctg 360
cctgggtacc gtgaatgacc acggtgaaca agagggctca gtaaggaacc ctgcngactg 420
ggtttaacta ctgtagnggg ggnngacaat cttntttttt aaaaangggg gacntttggg 480
gaaaaaaaan tttccccntt gggggntgga aaaaaaaccc acccag 526

<210> 592
<211> 521
<212> DNA
<213> Homo sapiens

<400> 592
tgttggcatg aatgaaatat aggatgactc atccaatgag aatttgaatg ctggcgtaaa 60
accatagaga aaatccaggt tcaataaaaa ggctaataat tcacagaaat atcctgggat 120
caaagagaag accctgtggc ctcattggac attagtaggt gccttggaag aagcagaggc 180
aggagacaca aaggacttca agtgattgga acaagaactg tagaagacat acctaagcac 240
aggagagggg aaagagagcg ttcaattgct tttgaaatga gtatttaaaa accagcctca 300
ctcagggtgg ccccttgcag tcctctgctg agtcaactct ctgcttggca gcctcttgtc 360
catagctgac tcagggcaga aaggtgattg attgccttaa gagccttccc ctgacctctc 420
actcggntnt tctttcttcc cccaccttnt ttcanaagnc ccctntaaaa cccaagggtt 480
tttccaaaag gcctttttc ntttgcaaaa acaaaaccag t 521

<210> 593
<211> 392
<212> DNA
<213> Homo sapiens

<400> 593
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tgcctgtccc cagacccggt gtggaatcag tgctcccagg ttcttctggt taatacaaca 120
gagcaaatcc ctgaaggctg ccgctaaaag gcagaaacca ttactttcca actatctgat 180
acggnttggc tgtgtcccca tccaaatctc atcttgaatt gtaactcccg tgattcccac 240
ccccaccccca aaatctggcc attaaactgg ccccaaaact ggccataaaa aaaactctct 300
gcagcactgt gacatgttca tgatggcatg acgcccatgc tggaaggttg tgggtgtacc 360
ggaatgaggg caaggaacac caagcccacc ca 392

<210> 594
<211> 460
<212> DNA
<213> Homo sapiens

<400> 594
gtttttcaga cttcctgaca tggcaactgg cttcaaagag agcggaaatg gaagttgcca 60
gcgttcttaa gacgttgatg tttttcaagt tcattttgaa attcccttct ctttctttat 120
tcaagaagat caacacacag ctaatcatca ccacaaagag tactgcaatc aatataagaa 180
tacctaccct ccctggtaca agccaaggct ggcttcccag gaatcctcan ggtttgccag 240
cctttgtgcc tgtgccccac ttccctcttg aggtgtggtc ttggactgaa agggcgtgac 300
ctctttggat ccactttgga aatcctccag cttcttgcaa ttggttttat taaaanacca 360
ttntgcnttc ttgggnaaaa tttaatggcc ttctcttntt tgaactttgg aaattctttn 420
attgaaaaaa aaaaataaaa ancccnnggg tttttttggg 460

<210> 595
<211> 466
<212> DNA
<213> Homo sapiens

<400> 595

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ttttccacct tcttggacat ctctgaccaa gccgtcttac caggcttacc atgatgaata 120
agcaaaggca tcacagaaag ggaaaattaa cagttccatc ttcaaggggc atgtgtgtgt 180
gtgagtgccc atgcagatac acatgtgcta caagatgaag tagaagaata attctcacat 240
gaaggcaaat cagggatgaa aagaagctac ctctacacaa caaggtgaaa atctaagggc 300
ctcgagtaat gtgccccctc ccaaagcatt attattctaa gggcagaact gaactattag 360
gattacattt tcaatccaaa atttgnaatt aaatgnaatg ggnattttaa aaaatgaatt 420
aangggcccg gaaaangggt nggtttcaca aaacattaaa tcactt 466

<210> 596
<211> 347
<212> DNA
<213> Homo sapiens

<400> 596
gaaaggagaa ctacttggat tccttgagtg tctgaagttc atcatgccac atttcccagt 60
gtaaattttt ttgaggaggt gtctccatgc ttggcatgaa aaccagggga ggaaaataca 120
agatgcccta ctgtgnacag tgaagtgggg ttttggaaga tgtgctccag agaacggcgt 180
ctgggccccc acaatctccc catgttgcac agactctctc tgactcctgt gatctggccc 240
tggctgtcct ggaatactac cctctactcc aacagaattt ttaattgttc cacagtgtat 300
ttatgtacat tgttatctga gcctctgagt aaagcaaaac aggcatg 347

<210> 597
<211> 366
<212> DNA
<213> Homo sapiens

<400> 597
gtgctgcctg tggttggagg caaaatcctg gatttcctca atggcttgga gttggagggc 60
tgttcctgtg gttgtgattt naacccaagt gctagtagaa ttgagcactt agtttcctgg 120
ttatgttatc aaaccgaaat tcggattggc ctccctaggt ccctatattt gacaatggcc 180
acactgtgct gccaggaaca gacactggaa atatcagtgc ctcctttcac tctccaatcc 240
actagcatac aagctccatg gggccagggg tttttatctg ttttgttcac tgctgtgtct 300
tcaagtgtct ataacattgc ctgacatcgt aaatgctcaa taaatctttc atgactgaat 360
gactcc 366

<210> 598
<211> 527
<212> DNA
<213> Homo sapiens

<400> 598
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caggcatggt ggctcacacc tgtaatccca gcactttggg atgccgaggc agctggatca 120
cttgtggtca agagttcaag accagattgg gcgacatgat gaaaccccgt ctctactaca 180
aatacgaaaa ttagccattg tggtggcaca cgcctgtaat cccagctact caggaggctg 240
atgtgggaga actgaaccct ggaggtggag attgcagtga gccaagatgg cgctactgtg 300
ctccagcctg ggcaacaaag caacactatg ttttaaataa ataaataagt gctgagatct 360
caagaaaata caatgcctag cttcagaata ccatatatta tatattcata tggntataaa 420
ngnatcccnc cntggtttnt ntgcttaaan gaanngactt tcnttttata gtgatgccag 480
gcnctgctct aagaatttta tgtatcctaa cttattaaat ctcctca 527

<210> 599
<211> 544
<212> DNA
<213> Homo sapiens

<400> 599
aaaattctgg ttctcaatga caccagcatc attactgatt tgctttctac tcacacacaa 60
atagcctcca aataagaatg ccaacactat caccaaaaag gaaaaattat cttcgtttcc 120
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ggtcgagaca agcagtccca gaagtggcaa gagaaagttt gggaaggcag aaaaaacact 480
cctgangtga ctggtcacct gctcactcca aaaatgttac ctttanggtt aagcttttaa 540
taaaccaagc taataaaatc t 561

<210> 628
<211> 389
<212> DNA
<213> Homo sapiens

<400> 628
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tcctcccacc tcagcctccc aagtagctga gacaacagat gtgtgctatg aagaccagct 120
aatttttctt ttcatttttt gtagagatgg gggtctcctt atgttgccca ggctggtctc 180
aaactcctgg cctcaagcaa tcctcccatc tctgcctccc aaagtgctgg gattacaggc 240
atgagccacc atgcccagca gagggaaatt tatttagaga gaaaagagga cattcacttg 300
gtgttcttca acagctaacc cagatgacca aaccctcttt tcagaagccc ttaacatatc 360
ctgcaacagc aaaaaaaagg tgtttatac 389

<210> 629
<211> 204
<212> DNA
<213> Homo sapiens

<400> 629
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acagtgcttg tcacataaag atggcccaca aaacttcaat gacagaagag ggaaaggaaa 120
gaagtctgac agatatctaa ctatatccaa gaaagacatg aaaattcatt gatttataaa 180
tttgcatata aaatgtaaag aaag 204

<210> 630
<211> 173
<212> DNA
<213> Homo sapiens

<400> 630
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agtattccct ttggcacccc cacccacctg gaacaaagcc tgatgtaaag tctgggtgcg 120
actcagaccg gcctgggaaa gaatttattt aataaatggt ggaaagtggc ttc 173

<210> 631
<211> 359
<212> DNA
<213> Homo sapiens

<400> 631
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ggatcacctg agcccaggag ttggagacca gcctgggcaa cagattgaga ccctgtctca 180
acaaagaaga agaagaagaa aaaggccagg cgccgtggct aatgtctgta atcccagcac 240
tttgggaggc caagaaggga gaactgcttg aggccaggag ttcgagacca gcctggtcaa 300
catagcgaga cacccccccc atctcaaaaa taaataaatc aaaataaaaa ataaagagg 359

<210> 632
<211> 312
<212> DNA
<213> Homo sapiens

<400> 632
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tggctttaga aagcaaaaga aaaatttttt attaagaaat gaaaagaaaa aagacgcagt 120
atggactcag actgataaac catttgcatg agagaactat caccatttga aaaagagctt 180
ttttgcaagg tgtggtggct aactcctgta accctggcaa ctcgaaaggc tgaggcagga 240
ggatcacttg ggccaggag gtggagacca gctggcaatc agcaagatcc tgtctctaaa 300
taaagaacca at 312

<210> 633
<211> 378
<212> DNA
<213> Homo sapiens

<400> 633
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tataagatct cctaaagtgg ctttgctgga acctctcaca aagaatctca gacttaacct 180
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agtggcactc taggccagcg cagtggctca cacctgaaat cccagcactt tgggagactg 360
aggcgggcgg atcacctg 378

<210> 634
<211> 379
<212> DNA
<213> Homo sapiens

<400> 634

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aagcacataa ggcacgtggg atggccaggg gcctccagca caggaaggcc ccgagtgaaa 120
gcctagcaga gttaagcgac tgtacgacat gctgaaaggg atcagtgatt tctcctgcag 180
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gcctccaatg gcctcactca ctccaaccct caactttgca atgctggaat gctgagatta 300
tcgtccacaa ggagcagaag ctttcataga ggaacccatc gacgtggctc ctgccaaagt 360
cctcaacagg gcttcgaaa 379

<210> 635
<211> 376
<212> DNA
<213> Homo sapiens

<400> 635
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tcaaatggaa accagattgc acttggtcac tgacgaagca ggagattaaa caagctacac 120
tgtgtctctg ggagaacaaa aagccaaaag gcacatttat cacctctgaa tcacaatgga 180
gtctcactct gtcacccagg ctgcagtgca gtggtgccat ctgggctcac tgcaacctcc 240
gcctcccggg ttcaagcgat tctcccacct caacctcccc agtagctggg attacaggcg 300
tgcgccacca cgcccggcta atttttgtat tttagtagag acggggtttc accatgttgg 360
ccaggatggt ttctaa 376

<210> 636
<211> 193
<212> DNA
<213> Homo sapiens

<400> 636
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aaaggatctg ttccanacct ctctccttta ctttgtggat ggccgccttg cccctgtgtc 120
ctcacctaat cttccctctg tacgtgtgtc caaatttcct ctttttataa agatgccact 180
catattagat ttg 193

<210> 637
<211> 471
<212> DNA
<213> Homo sapiens

<400> 637
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atagcctgcc atnngcaaca tncatggntg ganctnnaag acnttannct gagtgaaaca 120
agccagacac agaagcacaa atattgcatg atcccacttt tataaggaat ctgaaatatt 180
caaagtggta gaaccaaaga gtggaaaggt ggtttccaga atagttgctg gagaagggag 240
aaatggggag gagtgattca aaaggtacaa agtgtttata tgcaagatga ataaattctg 300
gacaaaagag ggcctctagt taacaataat gttttattat acctaacatt ttgctaagaa 360
aatagaactt acgttaaatg ttcttaccac aaaagtaaaa aaaattttag aaatttaaaa 420
ataattgtag tgagccaaga tcgtgccatt gccttcaacc tgggtgacat a 471

<210> 638
<211> 326
<212> DNA
<213> Homo sapiens

<400> 638
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ggatgaacat ctcttggatg gatgggactg aaactgaacc ttgaaagata atgctgagcc 120
tggataagtg ccccaccgtc cctctgccca aattcaaatc cttcatggcc cagtgcaaac 180
aacttctcaa aagccccaaa catctttgtc taacaggaag cttttagctt ttttactgtt 240
ttgacattca tttcccactt agtattatgc ttacttgtgt attaaccttg tcacccctac 300
tagactataa aattcttaaa aacagg 326

<210> 639

<211> 289
<212> DNA
<213> Homo sapiens

<400> 639
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ccactgtagc ctcctgaggt ggcaggatta cagcataagc caccatgcct ggcctcagtc 120
acactttgga aaagaagact atggatctac atgttcattt tgtggtcgaa ttataaccaa 180
cacgccactc tatctgcctc cactctgctt tttccatgcc tgtacttaaa tgcttctcag 240
aatttttaat gtacctccct gccttttgcc atagatttta tactcactg 289

<210> 640
<211> 254
<212> DNA
<213> Homo sapiens

<400> 640
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aatgagttca cagagtgaga gctggtggtt taagaaagcc tggcatctcc cttgatccct 120
ttctcttcat gtgatatgcc ctgttgcctt ctgccatgac tggaagcttc cagtggcctc 180
gccaagaaca gatgccagaa ctatgcttcc tgtacagcct gtagaaccat gccaaataaa 240
cctcttcata aatg 254

<210> 641
<211> 285
<212> DNA
<213> Homo sapiens

<400> 641
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cccacctcag cccccgagta gccttttgag caggttcagt ctggttaagt ccaanctgaa 120
ttgggccaat tgttttgatt tttaccctgg atgaaatact catatccatc atnntttatt 180
aaccccccat ntnttacaca tntggcngca agtactggga ttcaggcaag agccaccgcg 240
tctagccaat tatacaattt ttaaaataaa ttgaaatggt cgttg 285

<210> 642
<211> 290
<212> DNA
<213> Homo sapiens

<400> 642
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aaaataatta tgaagaattt caagatagca gagcattaaa tcactcacat agctccattg 120
cgtgaggggc tctgtgcaac tgtatgggtc acatgcccat gaaatggccc tgctgctaca 180
agagacaaga aagatcacct ctcctgtatc agttcccata ttaatcaccc cattttgacc 240
attctacaaa tgttaactgt tatgcttgtt attaaaaatt catcaagtgc 290

<210> 643
<211> 331
<212> DNA
<213> Homo sapiens

<400> 643
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tcagtggact cttcctttca caaaacattt ttctgtagta tgctatgctg tttgacagca 180
ttttactcac agtagaactg ctttcaaaat tggagtcagt cctctcaggc cttgccaata 240
ctttctcaac taagtttatg tagtattgta attcctttgt tgtcatttaa acaatgttca 300
tagcatcttc gccaggaata gattccatct c 331

<210> 644
<211> 401

<212> DNA
<213> Homo sapiens

<400> 644
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gaactaggag agagaaggac gtggacagga ggaggtgttt gactagaagt gcgtccaacc 120
aggccgggca cagtggctta cgcctgtaat cccagcactt tgagaggccg aggcgggagg 180
atcacctgag gtcaggagtt cgggaccagc ctggccaaca tggtgaaacc ccgtctacta 240
aaaatacaaa aattagctgg gcgtggtggt gcacgcctgt agtcccagct actcgggagg 300
ctgaagcacg agaatcgctt gaacctggga ggcgcaggtt gcagtgagcg aagatcgcgc 360
cattgcattg cagcctgggt gacagagcga gactctgtct c 401

<210> 645
<211> 132
<212> DNA
<213> Homo sapiens

<400> 645
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tcaaagttgg aagacattcc tctaccatct acttattctg gttatacatt aaagcatagg 120
agggcatagc tg 132

<210> 646
<211> 125
<212> DNA
<213> Homo sapiens

<400> 646
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gactcaactg taaagagaac acaaagctcc agtcatagga gaaagaataa aataaaactg 120
ctatt 125

<210> 647
<211> 290
<212> DNA
<213> Homo sapiens

<400> 647
gggcattcag ataagccatc atatcccctg tggacctggc acgtacacat ccagatggcc 60
ggttcctgcc ttaactgatg acatttcacc acaaaagaaa gtgaaaatgg cctgttcctg 120
ccttaactga tgacatggtc ttgtgaaatt ccttctcctg gctcatcctg gctcaaaagc 180
tcccctactg agcaccctgt gacccccact ctgcccgcca gagaacaacc cccctttgac 240
tggaattttn ctttacctac ccnaatncta tnaaacgggc ccacccctat 290

<210> 648
<211> 166
<212> DNA
<213> Homo sapiens

<400> 648
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acctcagcct cccaaagtgc tggggattat anggtgtgag ctgctccgcc cagcccagaa 120
gcaaacctta tattcagtct cattggatta aattctatcc ctccgc 166

<210> 649
<211> 616
<212> DNA
<213> Homo sapiens

<400> 649
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gaaaaaactt ttaccacgct tttttcatga tctttgaaca aggagctcta aattatcatt 120

ttgcactggc tctgtcccag ctcatgtttg ttgagtgaat aaataaataa ataaatgcat 180
acatacatat ttattagtac atggaacaca ctgattatct tccatttcct aacaacactg 240
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caactattta aaaatgccag agagcaaaca aaagcagaca agntagangg cttcaactca 540
cgaaatccan taacgtnctg actggagact catgcccccc ccccctgaca gaagggacag 600
aagctctatt gaaaag 616

<210> 650
<211> 101
<212> DNA
<213> Homo sapiens

<400> 650
angcagtgtg tggattacac tatcactgga aaaatacgna ttgagataga taggaaaacg 60
ctaaactggc agattagatt tttaaataaa gattggatta t 101

<210> 651
<211> 154
<212> DNA
<213> Homo sapiens

<400> 651
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gcagccctca ccagacacca aatcggccag cccattgatc ttagacttcc cagcctccag 120
aactatgaaa aataaatttc ttttgtttat aaag 154

<210> 652
<211> 241
<212> DNA
<213> Homo sapiens

<400> 652
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aataagagga agaaggagga ggaggagaag aaagaagaag aaaaaacccc actgggattc 120
tgacagggat tgcattgaat ctatagatca gtttggggag tgctgccatc ttaacaatat 180
taagtcttcc aatgcatgaa ccgtataaag taaaaggcaa tgtgagccac tctttactaa 240
t 241

<210> 653
<211> 353
<212> DNA
<213> Homo sapiens

<400> 653
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ctcctgcctt aactgatgac atttnaccnc aaaanangng aaaatggcct gttcctgcct 120
taactgatgg cntggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc 180
cctactgagc accctgtgac cccactctgc ccgccagaga acaacccccc tttgactgta 240
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tctcttttcg gactcaaccc acctgcatcc aggtgaaata aacagcttta ttg 353

<210> 654
<211> 609
<212> DNA
<213> Homo sapiens

<400> 654
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agtcctggtg gaaggcaaag tgggagccgg ccagtcacat ggccagagca ggagcaagag 120

agcgagggtc accacctccc tcagacgttt ctgggacaga tccaagccag cagagcagct 180
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gcaactgtag gaatcgactt tccatctatt tggagctcat cagtgctttt cttttaggtg 300
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gtgcacatgc caaaagaagg cagaggactg caggagcaag acgggttgca aaggggccgt 480
catgactanc acaatcctgg cccctcttct ttcagcntta taaagaccag tanaataata 540
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ctccaaaat 609

<210> 655
<211> 411
<212> DNA
<213> Homo sapiens

<400> 655
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gatcatgtcc tcggcaggga catggatgaa ggtggaagcc atcatcctca gcaaactacc 120
acaggaacag aacaccaaac accacatgtt ctcactcata agtcggagtg gaacactgag 180
aacatatgga cacagagagg ggaacaacac acaccaggcc tgttgcgggg tgggggctga 240
gagganggaa cgtacaggat ggtcagtagg tgcagcaaac caccatgaca cacatatacc 300
tatgtaataa acctgcncgt cttccnnnnn nnnnnnnnnn nnnnnaaaan ggngggggg 360
gccttttngt ttgggtttta acnggggntn ttttttaaa agggggggg g 411

<210> 656
<211> 296
<212> DNA
<213> Homo sapiens

<400> 656
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gtttggaact ccacagacac agaggcagca gcagcttttg gaatgtttca tccgttccct 120
gctatggtcc ctcatcagca tcctgcagtt ctgacctgcc caaccctacg caagaacttc 180
tggtgaaact ttctctaatc ctctcacttt ccttcaagac ctttacttcc gccagctcct 240
ctactatttg aggaaggacc aatttctata ataaatccct taatcccata ataccc 296

<210> 657
<211> 523
<212> DNA
<213> Homo sapiens

<400> 657
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atctgaaacc atctagtcct ttgcactcca tttaaggatg aagaaagtaa ggccgagagg 120
gggaagcaga gtgacctgct caaggtcaca gagaaggtga cgtggtgtac aacgaccttg 180
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ccgggataaa ggttgagaaa actattttct tttgaaaggg cgggcttcca nccttggccg 480
gggggccaaa aaaaaaaggn ccctggatgc tttttttgac ccg 523

<210> 658
<211> 471
<212> DNA
<213> Homo sapiens

<400> 658
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tccgttcttc atctatgggt gacctcacaa gtcctctgcc tcaattctgt caccgaaaga 120
atgaccattt tacctggtca ggccctggca tcgggtaagc ctcggatcaa atctcatctc 180
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gaaccagaca aggctggagg caagacatgt atgtgaggtg tgtggnctca aaagtcanga 420
ggctacatct cccttcnaat atatttncct ttnaatggat tttctatgaa c 471

<210> 659
<211> 303
<212> DNA
<213> Homo sapiens

<400> 659
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cctgctgggg cgcgaggtgc agagactgta ccgaccgagg acccagaggc tgtcaccacg 120
gaggggaagt cctcagctgc acaggttggg gggggggggg ggggnccnac ccatctnttn 180
aggtttnnnt tcngccttgt tttttnnttc caaaantttt atttttgggg ggnctnnatt 240
tttnncagna cccttcgnnt tttnantttt ttgggttnnn antaaatacc ctgaatttta 300
ccc 303

<210> 660
<211> 526
<212> DNA
<213> Homo sapiens

<400> 660
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cacttaaagg cagttctctt caaataagag agtctcactc tctcacccag gctggagtgc 120
ggtggcacga tctcagctca ctgcaacatc tgcctcccag gttcaagaga ttctcctgcc 180
tcacttacat agatgagttt gataacagtc aagctgaaac taaaaaggcc atgatgagat 240
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ctgatcttac caggcatgcc aggagaatac gctgccaggt tccctcacct ctaccctcca 360
actacagatt gaaaagtctg ctttgcctct tctaaaccat tgcgtcttga acttaaatgt 420
gctgataaac taccagagaa tcttgttgga aatacaaant tntattcncc ncggnttngg 480
aanggggnac cnagaaattt ttntttttcc aacaagcttt taaggg 526

<210> 661
<211> 499
<212> DNA
<213> Homo sapiens

<400> 661
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gctcatccgt aagaagaaac tccccatcta ttcaagttgg atcatgagat tacagcagtt 120
cagtcacata ttcaggcttc acttccaatt ctagttctct tgctgtttcc accaaatctg 180
cagttacttc cacgagtgaa gtcttgaacc cctcaaagtc atccatgagg gttggaatta 240
atttcttccc aactcctgtt aatgttgata tggtgacctc ttcccattaa tcataaatgt 300
tcttttttttt ttttgggaaa gggngtttna nttngccccc nggnngnagg gcaggggggg 360
ggnntgggtt aatngaannn nccncntcng gggttnnccc anttntcntg cctaanccctc 420
cnggggaggn gggaaaaagg gggcccnccc nnggcccggg tatttttttt gtttttttaa 480
aaaaaaaggg gggttcccc 499

<210> 662
<211> 497
<212> DNA
<213> Homo sapiens

<400> 662
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ggaatccgct cttctcccca gctctgctga gcacctcatc agacatttta agcagctgtg 120
tcacatgact tccagtacag ggagccccac accaggcttc catgccagct ggttactccc 180
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gattaccgaa tataataagc acatgatatg tacatatgca tatatacacc gtttgtgcat 360

gtgtatgtat agagacacat atgtcactaa aataactgct cacagatatt taatttcaaa 420
ctttcatttc ccctttacca ccttntnggc ccaatcttcc ccaacaaaag ccgagggga 480
ttaaaccggg tttggtt 497

<210> 663
<211> 580
<212> DNA
<213> Homo sapiens

<400> 663
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taagngaagc aggaagagcc atttataaaa ccatcaagat ctcgtgagaa ctcacacact 180
atcacaaaga acaggcatgg ggaaaccacc cccatgactc cattacttcc caccattccc 240
ttccaggaca tgtgggggga ttattggggg attaccaatt caaaggatga agattttgaa 300
gttgggggac caaccatatc actatttgtg aagnatgctt ttattattgg gcaaatataa 360
gttatttgca taaaagttca ttaaagtatc ttgctctttt ttngnaacaa gggacaaatt 420
gggaagcccc ttggattatt attaccaaaa ggctttttga ctgggaaata attatatctt 480
tccaatatga agtaagacag ccttttgaan ggaaactggg ngggtnggaa ttttttaaa 540
ggctttttaa aanccccctn gggaaaaccc tgggccctta 580

<210> 664
<211> 367
<212> DNA
<213> Homo sapiens

<400> 664
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tctctatcac agacttacag cttcctccag ctgcaagaaa ccctggtctt gttcttatct 180
actaagcaaa tgaatattat aatcgacaaa taaatgagct tgattgggtc ctcatccact 240
tattcactca tgtcacaaaa attaagtgaa ttacaaatat ggaccaagca ctgaattcat 300
ttttaaaaat ttaatgaata aataaaatga tatgagtaga tgcataaatg aacaaatgac 360
taaaact 367

<210> 665
<211> 461
<212> DNA
<213> Homo sapiens

<400> 665
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aatgcaggca caggtgtaac cccagccaac accacatggg gggcagaaga accatacagc 180
tgagcccagc caacccacag gctttccaga aacaagccag gagtgaggtg ggactcttct 240
acattcagtg actcaatttg gtcagaacta aggacaatga ggaactggcc ttgggtgcaa 300
aatttaaggg agtgcgaaaa attgagtcat tgagataaat tatattttaa tgcaattttt 360
aatgcaatat tttaactaat aaaaattaat gcccaaaaaa aaaaaggcca gcgnggccaa 420
ttcagttttg gacttaaccc aggctgaact tgcttaaaag g 461

<210> 666
<211> 530
<212> DNA
<213> Homo sapiens

<400> 666
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ccgccatctc ccaggttcaa gcaattcttc tgcctcagcc tcccgagtag ctgggattac 120
agatagtagg actgaacttc tgagaggtta agcgacatgg cacagattac acagaagaga 180
aagattttga agatcagatg aagtagttac cttggaatac tgcagaagaa gggtctggct 240
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ccngtgggga gnactttgnc cggcccaatg gatttntttt tttgggctga 530

<210> 667
<211> 136
<212> DNA
<213> Homo sapiens

<400> 667
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gatgaggaaa ccgagcctca gagaagtaaa gtgaaacacc caagttgata gtgtcaacaa 120
attaaaagtc caagcc 136

<210> 668
<211> 518
<212> DNA
<213> Homo sapiens

<400> 668
gcccacattg ccgtgcggtt gggccaagta actcnttgac ccgaggaacg ngntgtgnga 60
cattgcattt nggatggcna ttgaagggga tgtgctattg cccanaatat tccaaacccct 120
gggacccgnc ttagaggggc atggctgnct tcagggganga agccggactc ccaaaattgt 180
tggcaaaatg accccccattt taacncttca ngcatgngga gaatgcatgc cctgnagagn 240
agggatccat gaatggaaga tcttgtggcc aagattggcc tttnatcatt tcacctctcc 300
aaacttccat ttcttcncaa ggnatgaatg atgggaaata naaattgacc tggcngtgaa 360
tgccctggaa ancnacngtg ctgaatcctt aaccacctta ctnnntacct tttccttaag 420
cnttnncccc tgggcttaga aaattaattc accgnagggg gnttggngtt ntggctttgg 480
aaaaaaagcc ctngncttct ttnncctgga atgggaat 518

<210> 669
<211> 296
<212> DNA
<213> Homo sapiens

<400> 669
aatctccctt gttgtggatt tcagaccttg agtgtacagc tccccatctg gactctcgtg 60
aaggtcgtgg taaacaacac acagagcatc tctttgtcac gggctcagct gacacgtctc 120
cctccctcac cactgccccg ccagcctcca gcagcacatc tgcggtggac aatgagtctc 180
atttcacatt ttggctctgc ggtaggcatc atcatgggga cagaatacac accacaagat 240
aataaacaag ggactgttca agaacaaata tcaaaataaa gacaaaagga aagagg 296

<210> 670
<211> 338
<212> DNA
<213> Homo sapiens

<400> 670
ggacacttgc ccttggaacc ttgtcttaag gaaacccaga tcgaatgcac agactacatt 60
ggttgttgtg gttgacagtt gcagctaaga ttcaagccta cagccagtat ctagaccaga 120
tatatgaatg aatgagcctt tcttgcctcc agccttggtc tgttctaccg gatactgaag 180
tgggagaaat aagttgtccc cactaaggac tgctcaagtt acagatttat gagcaaagta 240
aatgttgtca tggatttcag tcactaaatt ttgggtggtt cattatgcag caataggtaa 300
cacaaactat taaagtcttt attagtataa caagcccc 338

<210> 671
<211> 452
<212> DNA
<213> Homo sapiens

<400> 671
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ctgggttatt gctccagagc caatgttctt ggggaaagga agatatgccc tttgtcaaca 120
ttgccactgc tggtctgtaa actcctagac ggccagctgg tggttcacaa accaggactc 180
cttgctctgg ccctacccct acctaccaga atgaccgtga acccttcccc actcactcct 240
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tggactaggt taaggacttc ctgctatttc tctctcccac actctaagnt tccttaggaa 360
tgcttcagaa aacagcangg gttggggcaa ggatgccact tgagtcccag agcaacttca 420
atttcatagg gcacataaat ttatgtgaaa gt 452

<210> 672
<211> 513
<212> DNA
<213> Homo sapiens

<400> 672
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agggcttaag cctatccgag atcagaaggg aacttttcca gtctccaaat tgtacaactg 120
ggagctataa cactcaccga gaagatctgc agcttctctc ctgaagccag cgagaccatg 180
agcccaccag gaggaacgaa caactccaga cgtgctgcct taagagctgt aacactcaca 240
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actccgaaca catctgaaca tcaaaaggga cagcctccag acgcgccacc ttaagggctg 360
naacacttca ccccggccng ggnaaaagnn gggggggtt tttcccccc gncccngggg 420
ggggnntttt ttttcccaaa ntttttttccc tttttnggg aaaaaaagnt tnccccaagg 480
ggnnggggg agggggaaaa acccccccccc aaa 513

<210> 673
<211> 150
<212> DNA
<213> Homo sapiens

<400> 673
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ctactcgggg agctggtcaa atgtggaatt tcgaatatca aatatgtata aaataaatag 120
atgaaagagt acatctcaaa aaaaaaaacc 150

<210> 674
<211> 423
<212> DNA
<213> Homo sapiens

<400> 674
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tacagagacc tgtgagaatg gtcagaactc catggatcat gatggaatga tcagggacac 120
tataatagcg ttcattttat gtattaagcc agatttgcac aacaattcca ttgtaataca 180
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aagaaaacaa ttttcctaag ccaaatgtct tttgtgagag atttcaatgg tcatttgatt 300
ttagtttaaa gatcatctga ccttatgatt caccccgattc ttaaatgcac atctcaaata 360
taattggtcc ttttcccaaa ttttttttt tggggggga aaaggggntt ttttaaaaaa 420
ttt 423

<210> 675
<211> 497
<212> DNA
<213> Homo sapiens

<400> 675
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agacctcttg ccaacaacca tgtgagtaac ccgtcttgga agacgatcca ccaaccccag 120
tcaaggcttc agatgactgt cactccagcc aacatcttga ctacgacctc atgagagact 180
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gggaggtttt ttttttttt tttcccccct tttttttcc aattttnccc ccccnatttt 420

taaaaaaatt ttccnnttta aaaaanccca aagggcccaa aaaatttttt tntttttnaa 480
aagggggggg gaaaaaa 497

<210> 676
<211> 517
<212> DNA
<213> Homo sapiens

<400> 676
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cctccgcctc ctgggcttaa gcaattctgc tgcctcaggc tcccaagtag ttgagattac 120
aggcgtgtat caccacatcc ggctaatttt tgtattttta gtagagacga ggtttcacca 180
tgttggccaa gctggtcttg aactcctgac ctcaagtgat ctgcccacct cggcctcaca 240
aagtgctagg attataggca tgagccactg cacccgactg tattgtaaag catattgaca 300
ccttcaccta actgtgtttg gatcaagtca ctctgggaga aagccagttt caatatcctg 360
aagatactta agcagtccct taatttttgn gggggaaaag gnaaaaagga aaantttttt 420
tccccgnttt ngggggggcc ccaaaaaggg gggggnaaa aaacccttttg gggaaaaaaa 480
ggncccnttt tccccttttg ggtttttccc caacccc 517

<210> 677
<211> 407
<212> DNA
<213> Homo sapiens

<400> 677
gcgtatgtgg acataaaaac aagcttcata tattgtgtgt cataggggac tgccctacct 60
gccaagggtc tcactggatc tctgtactca tttcctgttg ccagctggtg gacaatatgg 120
tgctaagaac tcaagaagtt ggtcctcacg ttgaacctca gaggtcacca aaccttttctg 180
gatagctgct agggagtttc tggaggtgct caatagtgac atatgtcaag ttgagaaggg 240
acagctgatc ttccagggta gagatggatc cactccccac tctcataaag aagatgtggg 300
tttgtttgac cttcactata taggaaaaag cctcacaaat tcttcanccc cttggatgga 360
ggcttnaann cnccccttttt tnncccnaaa ncnaaaaacc tttttgg 407

<210> 678
<211> 343
<212> DNA
<213> Homo sapiens

<400> 678
ggtcctgtct gggctgtggt cagagggaca tgtggctttg gaagaacggt cggagagaag 60
caacattgct ggctctgatg gaggaagaaa gccgaggaat gccgccagcc tctacaagct 120
gcagagacaa ggaaacagac tctcccccac aacctccaaa gagaaacgca tgctgccatc 180
accctaatca tagtctggcc tgcagaacca ggagtgaaag ataatacata tgtgttgttt 240
taagccacca cgttcgtgaa atttcttaac agcagtagta ggaagctaat atacccgcca 300
agtagagatt gattaatttg gttaataaac aacaactcct agg 343

<210> 679
<211> 511
<212> DNA
<213> Homo sapiens

<400> 679
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catccattca ttccgggatt cccccagctc atggacacag gtcggtctct aactacagac 180
agccttcttc tggaaactct caccagcctg atttctaaac tcccagtcca ccttcacatt 240
gtttgcctgt tttcagtgcc tttcctctgc agatctctca gtaggcagcc gtaaggagtc 300
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cctgggaaac cccnaaaanc cttttttccc cccntttttt tgggtttggg ggaaaaggga 420
aaaaaaaaaa gggggggggcc ccnaaaaatt tttttcccaa aaaaaaaacc ccctttcccn 480
tttaaatttn cccttttttt taaaaaaggg g 511

<210> 680
<211> 155
<212> DNA
<213> Homo sapiens

<400> 680
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gaaatggagc tcaagaaaac ttcatctgat tctcaaagaa cacacatctc aactgacatc 120
tggccccaca cttggtaata aaagtgcatt ggtgc 155

<210> 681
<211> 512
<212> DNA
<213> Homo sapiens

<400> 681
agacggggtt tcaccatatt gcccaggctg ttctcaaact tctgggctca agcaatctgc 60
ccaccttggc ctcccaaagt gctgggatta gagaggcttt cctccccctg gatgatagtt 120
gcaccaccat caacccagtg gctcaagtct gaaaagtcgc tcaagtcatc tttgaatatt 180
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ttcttttccc tttttttttt ggggggggga aaaaggngtt tccccttttg gggaaaaggn 420
ttttaaaaaa anatttcccc tttttttttt ttttaaaaaa aatttaaaaa nccccaaatt 480
ttnaaatttt aaattttccc tttgggggaa aa 512

<210> 682
<211> 536
<212> DNA
<213> Homo sapiens

<400> 682
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aataaaaata aaaataaatg agccaggtgc agtggcgcat gcctgcagtc ccagctactc 180
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gaactctaat gaagaaatga atggcttcat gaaactgcca agcaagatca agcagatcaa 300
gaattaatta ccgtgaaact gaactgatga agatttaaag aaactatttc tcttaagctt 360
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ttttttttn gggnnggggg ggaaaaaacc cncctggggn aaaaattttt ttngggggggg 480
aaaaaacccc aaaaaatttt ttnacccccct tttttttttt tttttccccc tttttg 536

<210> 683
<211> 372
<212> DNA
<213> Homo sapiens

<400> 683
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acgattctcg tgcctcggcc tcctgagtac ctgggactac aggcatgcac caccacgccc 180
agctaatttt tatattttta gtagatacgg ggttacattt tggccaggat ggtctcgatc 240
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caccgcacct ggcctcaaaa agagctcttg aaatattagg gctagttagc cttttgtcag 360
tattggaatt tt 372

<210> 684
<211> 470
<212> DNA
<213> Homo sapiens

<400> 684

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tcaagaaaca aatgaaagag aacatctctg cccagccata gaagaaacta ccagactctg 120
aagtggaacc acttatacca gtgcatctac accaaaaggt ggaatgagag tggctgcttt 180
tctggcagcg tggagacgaa cattagaaag aagatgctgg atttgggtag catgaagcag 240
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tctcgatccg acgacttcct ttccnaaaag gcccctttt tttttttttt tgggaaaccc 420
naggntttgg gggggggccc ccccactttt aagggccccc aaaaattttt 470

<210> 685
<211> 540
<212> DNA
<213> Homo sapiens

<400> 685
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atggagggag gatgaaacct gatgggcatc ggggacaagg ttcccatgat acagcngcan 120
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tttttttttt tttcnaaaac cccccctttt tntttttgg ngggggngna aaaagaaaaa 480
ntggggnggg gngntnntcc nnaanncccct tttttnctn ttgggggggg ggaaaaaaat 540

<210> 686
<211> 416
<212> DNA
<213> Homo sapiens

<400> 686
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ttgaagggcc accaaaccag ctgttcccct catggaagag gagcatagac ataaaatgtc 180
aaggcaatgg ggaaggggca gagaaaaggc acaaacactt ggaggagaga cagaacaatt 240
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cagcagatct gaaggaaatc cagccctggc atgaaagaaa cggggcaggc caggcgcagt 360
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<210> 687
<211> 469
<212> DNA
<213> Homo sapiens

<400> 687
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ggttaaagaa aaaagtggtt attaaaaggc nacaccgaag gtccttcaag tggntgnaac 420
tggttnataa cntgnctgtg gtanggngga taccccaatc ttccaaagg 469

<210> 688
<211> 608
<212> DNA
<213> Homo sapiens

<400> 688
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cctcaaagtg ggggggccaa agggcccttt ggtttggcca cattcaacgg taaaaaaatc 120

tttaacgggg tcttttaaat ggccctttca cgggnccang gaaaccttca agctttcaaa 180
aagnaaaaac ncaaaaccgc gtcaatggct ntcatttaaa tttncncttt aattcggggc 240
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atggtgcctc caagggaacc cttcaccntn ttgggaagtc ttggaanggt ttgaagcccc 480
canaggaaaa cctcttatgg tcttcccatt atttttccat ttccaanaac aaccccttntt 540
nttttttat tggaaaaccc cnttggngaa aanngggcnt ttaacttcaa nttntttttta 600
aaaacatt 608

<210> 689
<211> 174
<212> DNA
<213> Homo sapiens

<400> 689
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agtggagatc tgatacagac ttttcaagaa tgtctcattg ctttagacaa ttccctgaca 120
ctacctgtct ggtttctttg attagcaaaa ataatcatag taaaaatacc aatc 174

<210> 690
<211> 399
<212> DNA
<213> Homo sapiens

<400> 690
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tggaagtggc tttttctcga aataaaacct tcaaatgaga cctcagccct agacaccacc 120
ttgattatgg ccttgtgaga gagattctaa agcagaaggc ccaggtcagc tgtgcccaga 180
ctcctgattg aaagaaactg tgaggtactg gccagacgaa gtggttcaca cctgtaatcc 240
cagcactttg ggaggccgac gtgggtggat cacctgaggt caggagttcg agaccagcct 300
ggtcaacatg gtgaaacccct gtctctacta aaaatataaa aattaaccca gcatngnggn 360
gngtgcctat aattccactt ctccaaagct tgaggcaga 399

<210> 691
<211> 457
<212> DNA
<213> Homo sapiens

<400> 691
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ctgggaatac tttggaactg aagagaacct attaggagag agaaaaaaca gagtcatgat 240
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acacaacatt tctctttgat tcataacgtt aataaattct acttatcgtt tgcaataatt 360
ccaaggngtt ctaaaaacat ctttatatta aaaaagagtt ccatattagt ttgaattact 420
tcangaaaaa aatggcctat tccnccccttc caagctt 457

<210> 692
<211> 431
<212> DNA
<213> Homo sapiens

<400> 692
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ttctccagct ncacttggtc tgatgaataa ttccaaccag cacttccaga agcttgagct 180
gctctttggc tttgataaca gctagctttt tgggggttac ataaacattc acatntttttg 240
taccgctgtt ngacaatgac tcctggcttc tgatnggact gagccttana aaggatctgg 300
gccatnggna tggtnttttt tttattgccc cncttnggta aaaaaccttt cctncttnaa 360
aatttgggga accgcttgan ggngggggca nanatttttt ttttttttga aggntcttca 420

aagaaaaaac c 431

<210> 693
<211> 618
<212> DNA
<213> Homo sapiens

<400> 693
tcagaaactt ganggaaaag aaccttgggt cacttaattc tncgccntct nggaaaatca 60
annettngtt atggacctcc ttgnatngat ccnacttgag accccaccan nttnggccca 120
acccttgctt gggggggaat taagaaaacc cttcntcttg tccanaagtt aaagggggge 180
ctggaattgg ggttccaagg gtcacatttt tttgggaacc ttcaanggtg gacanggccc 240
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cattcttgaa ntttgccaga aaaacttggg aaagccaaga agaacccccca agtttangga 420
agcctactta ccaacttatt tccanggcca aggaaaaaga acaagttggg cctttgggaa 480
ttgggggaat tgtnggtatt ttggaaaagt ngggaagact taacccanaa nggttccttt 540
gggnaaaatg gtaccantcn tttnttagct ttccccaaan aactttgctt gcttnggtgg 600
gggaaatggt tccaaggt 618

<210> 694
<211> 435
<212> DNA
<213> Homo sapiens

<400> 694
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tctgtcagag ttaaggggcc tgaatgggta caggtcacat tcttggagct caaggtgaca 180
ggccagagcc cgggtcccca ggacagtgca gcaccttgtc caggcgggcc tcccgtttct 240
ggctccgggc tgagcttcct ggagaagagg aaggttcatc tgaattgcag aaactggaag 300
cagagagccc agttaggagc tactacaact atccaggcaa gaaagacagt ggcttggatg 360
gggatgtggt attgaaagtg gagactanca naagtcttgg naatgtcatn ttatactacc 420
aaaacttgct gctgg 435

<210> 695
<211> 282
<212> DNA
<213> Homo sapiens

<400> 695
taaccagtga ggaactgagg tctcccagca accacctgtg tggagttgga agcggcgctc 60
tctctctctc tctctccagc aaccagtgag gaactgaggt ctcccancan ccacctgtgt 120
gaagtnggaa gtggattcct tancctcagt caaaccttga aacgactgaa aacctggnca 180
acagcttgtn taaaacctca tgagagaccc taagccanac tcncttacct acagaancct 240
ttatntgtat ctctgaataa atgtntgtta ttttaagcta ct 282

<210> 696
<211> 451
<212> DNA
<213> Homo sapiens

<400> 696
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acaggagggc aaattctcat ttcttttgga aagtaaagat tcctctcttt ggtaaaagaa 120
acttctttgc attcactgaa caaccttccc ttaagaggga accaacaccg cctgatgatg 180
ggcaaactga ggcttacaga gatgggagac tgcctgcacg ggaccattca gctcagaaac 240
agtggaacta gaacttgagg ccatgccttt cagagctgct cccatcttct tactgtccat 300
gccgcctctg gcactttata aatgacagag ggtccgatat gggcatcatc acatggttac 360
ccatggtacc ctaaagtgca gaccccaagc ctctcacctg gacatctgcc acaaaagctg 420
taatgcantt gaaaattggt cttcccttgt g 451

<210> 697
<211> 278
<212> DNA
<213> Homo sapiens

<400> 697
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tangggantt gaagcnaaag atcacgctgc ctgcctacac cangaaacag ccaagacccc 120
ccttgcacga accaacattc ttccaccctc tccaactttt ttctggaacc ccttcacttn 180
caacgccctc aatgtacact tcactttctn gtgctcttcc taagagagta gtgntttntt 240
nctccccacc gagaaaaaaa aataaaagca acaactgg 278

<210> 698
<211> 293
<212> DNA
<213> Homo sapiens

<400> 698
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tcacgcctgt aatcccagca ctttgggagg ccgaggcggg cggatcacga gagacagggt 120
cttgctctat tgtccaggct ggattcaacc ttgtgggctc aagtgatcct cctgcctcag 180
cctctggagt agctgggact acggatgcat accaccacat tctgctcatg ccctatgtat 240
tcttttgtat gtatgggtgt aaaaacagag ataaaaacag agatatggat gcc 293

<210> 699
<211> 475
<212> DNA
<213> Homo sapiens

<400> 699
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caagtcccaa ggaggaaaaa ctatggatcc tggaaccttg ctgttgtcat acttgggggc 120
ctgtcttaaa agtctcactt ggtgatatgg gctgagtcat gtccctcccc aaaattctta 180
tgttgaagtc ctaatcccta gtacctcaga atgtgattag atttggagat agggtcttta 240
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tatctctgta agaagaggaa tgaggacaga gacacgtaca gaccaaggga ccatcatatg 360
aggacacaga aagaagggat ccatcttcaa gtgaagaaaa gaggcttcag gagaaaccaa 420
acctgcccac atcttgatct gggactttta accttccaaa atttaaagaa aataa 475

<210> 700
<211> 458
<212> DNA
<213> Homo sapiens

<400> 700
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agaagttcct aacgaggaca aaatgagagg tcatacgcca agtgtatcaa gtacacagaa 120
attacctcat ttccaaaggg aagattggat gatactccac agccaatatt gacttactga 180
agatgttatc aaatcctctg cctttcctca taatgatatg agaagataaa gacgtgctcc 240
gctacagagt cttcaaagga agcagaaaaa gtataataca taattttaac ttaagaggaa 300
cactgctgga catcatgaga attccataca atgagtgtca catctatcag aaaaccaagg 360
gtatgaactc taaagaaata gaagatggtg gtgaacaggg accacctctc tgcctgattt 420
gntttctgcc taggaggncc ttcataattg catgggtg 458

<210> 701
<211> 523
<212> DNA
<213> Homo sapiens

<400> 701
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gagctaaaga ttttgagacc agcctaggca atatggatgt attatggtat tctctggaaa 120

gattctgtga acaagcaaga cacctgtttc aggtcttgtt aaataccagg tctttccatt 180
tcctttaagc ctttcagaga tttangccat gtcatcatac ctgatcactt catacctgaa 240
ccccacaagg gcagcagcat cctccggtgt ctactacccg tgagaccccc tctagagaaa 300
gttccagaaa acaagatgag ttcaaagagt tcataaggga cttttggggg aagctacact 360
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ntcatatgac tttggacaaa ccactcatct tttaagnacc ctcanttcct canttatttt 480
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<210> 702
<211> 475
<212> DNA
<213> Homo sapiens

<400> 702
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cccacgttca acttgataag agaggagaga gcactgtgtg aaggcaagag ctggtaagct 120
cagacaacag aaagaccggg actaactcct gctcatcact tcactacacg gccttggcca 180
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aagcctcaca gggtccttca tattatttcc actcattatt gttgaaatct tccagttttc 300
tcattattcc caatgcttca aaataaaaga gaaatttagt aagattaaat aatggaaaaa 360
ggaagccaaa gaatatccag ttacgatgtt caaagagata agctggccct gaggcatatt 420
tatctgtcct aaaagaactt cccaaagaga aaattaaagc tnttccaata ccttg 475

<210> 703
<211> 527
<212> DNA
<213> Homo sapiens

<400> 703
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atactgccca cgtctagtgc aggagcagaa atcgaagtca tccatcagct agcgtgtgga 420
caagctcact attcacacaa acttaaccta acttaagtca atccaantcc tatttttggg 480
tgggtaaagg gcaggaagga aaattgtaan ancaagctgg tactgaa 527

<210> 704
<211> 505
<212> DNA
<213> Homo sapiens

<400> 704
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cctggatgct acgttttgca tcttctttag ataccсttga ctcgtacatc ctgtctgggc 120
taatgttgtt ttctgcttgc agtgtgtctg gagtctcaac aagtgcccaa gccaccctca 180
aagggtcact ccttgtttca agagcacttg tgcttgcctt gacctctctg tcgctctctg 240
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gccactctgt catactgttt tgtgtagtgt tttaaagcta atttgaacta ggcaatgtct 360
tagccttaga tatagacaga taattttcca gatcagacaa gctatagtaa agcttcaaag 420
ggaaaacttt tattcctaaa gagaatanaa aactcatctg ggtaatcat aattggattt 480
aaaaaatgac ccaagttgaa ttttt 505

<210> 705
<211> 377
<212> DNA
<213> Homo sapiens

<400> 705
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cctctgcctt ccaagttcaa gcaattctcc tgcctcagcc tcccgagtag ctgggaccac 120
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tgatgcccag gctggtctcg aactnctgcc tcaagtgatc cacctgcctt gacctcccaa 240
agtgctagga ttacaggcgt gagccaccac acctggccta attatatctt tctattaagc 300
cttacctaat aatagtaaga agtaggattc tctttggctg ggtcactatt caataaaata 360
ttaaagtcat ccatgtg 377

<210> 706
<211> 533
<212> DNA
<213> Homo sapiens

<400> 706
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nttcangngt gtctgnaagc tggcctnatt ccactttgtg cctggaaagg ggacacacan 120
gccctggttc ctggactgaa agcacgaaac aggatctccc tgtgttgccc aagctggtct 180
tgaactcctg gctcaagtga acctcctgcc tcntcctccc aaagtgctgg gatgacagtg 240
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ccctttttgg natctttggn ccccaanccc tgtagngaga aactgcctga gaaaaaancg 360
gnggnnacac antggagaac tggaaaaaaa accccggagt gggaancaca tctggtgccc 420
cnctccctga catgaatgtg accaactctg gttttaanat ttttgacatn tgaagccana 480
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<210> 707
<211> 520
<212> DNA
<213> Homo sapiens

<400> 707
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gccatcgcat cccccgtgac ttgcacgtat acgcccagat ggcctgaagt aactgaagaa 120
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gctccaccct tatctccctt cgctgactct cttttcggac gcagcccgcg tgcacccagg 420
tgaaataaac agccatgttg ctcacacaaa aaaaaaaagg ccagngaggc caattcaagc 480
ttggacttaa ccaggctgaa ctngntcaaa aggggggggg 520

<210> 708
<211> 508
<212> DNA
<213> Homo sapiens

<400> 708
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ccatttcttg aagctgcaga gttctatagc tggcttgggg caggtgggaa aagaagaact 120
cttctcccat tggaaaatct aaggcataca taaatttaat gaagtacaaa ctttctgtac 180
agatggagca taaacaaatg gcgtcactag atccaccagc cattcattca agctgtggac 240
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ccttgtggcc ctcccagggc taccctcctt gagtccatcc ttctggtcaa ccagcttggg 420
agccttagtg agtggcaggg ttgttgctag agagaaagcc ctggagtctt ctctgctcta 480
atgacttaaa ataaagtcca aactcctc 508

<210> 709
<211> 229
<212> DNA
<213> Homo sapiens

<400> 709
ggaaaacaat ggagcttcct gacatgtgac actgatgctg tttcactcaa caagcaaaag 60

tcttgctcct tcttctactg gaatatcagt gccatgagag ctgggatctt tgttttgatc 120
tctgctttgt ccccagcacc cagcacaatg cttgacacat agtaggtgct caataagttc 180
cactgaatga atatacacaa ccaatcctga taataaaagt ttgttattg 229

<210> 710
<211> 298
<212> DNA
<213> Homo sapiens

<400> 710
gctattgtcc tccagttcct agcttaaaac tgtacgggac atttccagta tagagcctgc 60
tgagaatgaa catgaaatca aggacatcac ctgatgatgg attatgtaga tggcgaaggt 120
gtggtggcac ggagacctct tggtgaccaa gccggacact gagcaatctg tcagcagctt 180
atcaaaagaa aacacaagtc caaactttgt angaaaatac ctgattaaaa tcactctttc 240
agggggtatc tagtacatct ggcaggccag tctggtattt aataaatcct gctccttc 298

<210> 711
<211> 299
<212> DNA
<213> Homo sapiens

<400> 711
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agaatttcac ttctggatga tgtgagcacc ctgcagtttg ctgtgtactt ttcatacact 180
tatgtattta tctaaaacct tccatgattt ttttggtgca gtagtataca gaatctgaac 240
tgttataagg tcaactgtaa acaattatct aatagttatt ctaaaacttt acctccaat 299

<210> 712
<211> 435
<212> DNA
<213> Homo sapiens

<400> 712
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aggaattgtc ccaggggagg ggaactggtg gaatgagtac ctggcaaaag gaaagcagtt 120
gtcatgactg gccaagacta aaggtcagaa gactttcact ggagatatcc ctccctatgc 180
ctggaagaaa ggaatattct tatctctgaa gacattggga aacacaataa tagctgaaaa 240
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tatgtttttc tcttg 435

<210> 713
<211> 334
<212> DNA
<213> Homo sapiens

<400> 713
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ctctgaaaac aacataaagc atcatgggcc gtgctagaca tttaaatgca agagccattc 120
tcttcaaagg actatgaaga cttggaacaa aacatcacag tcattccttt gtactctgga 180
tgccgaatgt tgcaatactg tctgcccgcg aacctttcca ttcttacagc aaatcactcg 240
tccataaaga cagactgtag tgattctaat gcttctgtaa aatatctact tattggcact 300
gcatcagaat aaatttaact ttattttaaa tgct 334

<210> 714
<211> 567
<212> DNA
<213> Homo sapiens

<400> 714

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cccgantttc caaatttcct tttttgt 567

<210> 715
<211> 652
<212> DNA
<213> Homo sapiens

<400> 715
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<210> 716
<211> 485
<212> DNA
<213> Homo sapiens

<400> 716
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tttcttctct actgaatcta ctgaaccatg ggtcttaatt aggtgaaaca gcatcaccta 420
cagtgggatt tggttgggac ccccaagtca ataatttgat tgaataaagc tctttggaat 480
tttcc 485

<210> 717
<211> 667
<212> DNA
<213> Homo sapiens

<400> 717
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accacctaat ggtgctatat taaggatcat ccaaaccagg tcaaccttct gagaggttcc 360
cagtcctgga gacaggtcaa aagtgaagct cagactggtc tggcacttat acagccatta 420
ggaagagatg agcagaaaag ctctaagatt ccacagccca gactggctat ggatattaac 480
gacctgcctc caaccatcca tacctgttct tttgntaatc tggttttacc accatgcaag 540
agagacaacc aaactcatac agtcaaaact gagtcataag accctctncc aatttttttat 600
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aaagact 667

<210> 718
<211> 679
<212> DNA
<213> Homo sapiens

<400> 718
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cataatagca agtagattct ttcaaagaca tgaacatata ggaaaataca agntttactc 600
aatttctcaa catttttcaa actggggtcc ttggatttgg gtttggggta aaaattaaaa 660
ggangggtct attgccaag 679

<210> 719
<211> 592
<212> DNA
<213> Homo sapiens

<400> 719
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ccacccccttc tctttctttc tgacctgaat gtggatatgt ggtttgcttc tgtggctgca 120
atcaggtgac atgaggcacc aaccattgga ccaagaagac aacagccaaa gacagaagag 180
cagaaaaata aaaggaaaag gcctgtgttt tgataacatc aatgagcagc agtaccagtg 240
ccaatagtca cctgtctcca gccttcttgt gaatgagata ctacaggtct gtattgcttg 300
agccatttct aactccagaa tatatttaag agtttcatac tgaagttgaa ccacacatct 360
ttctttgaac ttcctaacag gcaaaacaac tgcataaaag agatactcaa ttaagttatt 420
atttgcattg nctttgagga gaaaattgat agttcttcaa gagaggcact ggttcttgtg 480
aaacttaatt ctttaaaaaa tggcttgggt ggggcatcat aaaaagacac tgagntatgg 540
gggnaactgn atttaaatca tatccccaaa ntaaatgcca aaatagtttc at 592

<210> 720
<211> 316
<212> DNA
<213> Homo sapiens

<400> 720
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cncggtgggg aagagccttg agggtgcttg ccgccccagg tgacangacc cgaagattgt 120
acnanancac tctaattgcn cnaaaatagg cactatccac caaacttcct ggccttgaga 180
atngtttacc aanaacttca aagatccctc ttgcccacat cttgaaaaan gcccccccttc 240
cctataaaaa aatcanggac ccccttgctt aaagnnaaac aantgccccc cttgtnaaat 300
aaaattgttg gaaaaa 316

<210> 721
<211> 184
<212> DNA
<213> Homo sapiens

<400> 721
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ttcctctatg atcacaagaa ttccctattt agaactgcat atgggtgccc gttgggtaac 120
ngtttcaagt tgaaagaatt ttgcattttg tgttattgta ctagaatgaa ataatcttaa 180
tccg 184

<210> 722
<211> 592
<212> DNA
<213> Homo sapiens

<400> 722
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ntgacaatcg cncnntagcc cttcggctgc aatcattctt tccgtcagag tcatcatgag 120
ctgacgggct ttggagctgg aacacttaaa ctggtccaca agaaagtgct ggatgtttgc 180
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atggtgtttc agcagacacg agagcactgc tgctaaggaa agaaagcagt agcttgtcca 480
gcctacagac tcttgcacag gtcattacag ctacctangg gctgatgaaa tgtgacaatg 540
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<210> 723
<211> 167
<212> DNA
<213> Homo sapiens

<400> 723
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ctggattcag ggtccagagt gctcaccatt acaccatgga acctcaaacc agacatcaac 120
gtctctaatg agtctttctt tattccaata aaagaaaatg gtcagtg 167

<210> 724
<211> 477
<212> DNA
<213> Homo sapiens

<400> 724
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tgcacgggtc cacttacaca tggattttct tccgcctctg acagcaagac aaactcctcc 120
ttttccgcct ccttcacctc agcctattca atggtaagat gatgaggatg aagaccttta 180
tgataaagaa tagagcaact ggacatcagc aaaaaagtga atcttcacca aaaactccca 240
ccttatacaa aaaattaact caaactggac cacagactta atgtaaaaca taagactata 300
aaactttcag ataaaaacag aagaaaagtt ttcaggacct agagctacaa aactagttct 360
tagaattgat gccnaaagcn ccacccccca agaaaaatta attgggnctt tttcaaagtt 420
aaaancettt gntcaccaaa agaccctntt angcagatga aaagagtagc tgcagac 477

<210> 725
<211> 188
<212> DNA
<213> Homo sapiens

<400> 725
gaaatctgga ccatctgctg ggagaaatc tgtttctttg caggataaaa tgctccctac 60
aaatgtaaaa gcttttatat cccaggactg ttattcaaag cacctttaag ctcagcttct 120
tacagcgccg tctgaaaaaa tacaaaacaa cagctatgtc ttgcaagtaa aatcaatggt 180
ttcctcac 188

<210> 726
<211> 682
<212> DNA
<213> Homo sapiens

<400> 726
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gagtgcttag tctggggccc agcgcactca tctggaagca tgtcagcgga gccgcgggac 120
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tggcctttttg gtttttgggg cctcctagtg tcctccccac acttcggttt aggtctctgt 240
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ccctacctta gactcccaac cccatcgctg cacctggcct ggcctcctct ggaaggaagc 480
tcagatttgg agcctctgca gggcagggag cctgttggaa ccagcccang gccagccggc 540
tcattcctgg aattcctacc tcctctcact gccctgggtt tggcaccang tgctgagtgg 600
gcctcangcc aactgtgggc atgggctcga tgccgctgct ttcttcttca catcaaggna 660
ttcagccgna ttctacccca aa 682

<210> 727
<211> 663
<212> DNA
<213> Homo sapiens

<400> 727
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gtgtcattcc agcctcactt caagggcaga gacctggttg tcagtgagat catcacagcc 120
acagaggacc aagggcccca agagagtcaa catgcaatgt cagcaatgca gtgccttaaa 180
gaacatctgt ctacccatga ctaccacagt ggagaatgag gaaattgaga cccatagagg 240
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gatgagagta tgggctgctg gtaactaact tgtggactca agggcctcac accctcaagg 360
tcggacaact tccccaaaat gtcacattct gagacaggtt aaccaagggc ttgggcctct 420
gctgctgttt cctcttcctt tcaaaggcaa gcaccatgga taggcctgct ctgcagctcc 480
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cga 663

<210> 728
<211> 580
<212> DNA
<213> Homo sapiens

<400> 728
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caactgaaga aagggccctc ggagatcatc cagcccatcc ccctcatttc acagcgaaga 120
tgtgagctgg aagcttcaca gaaacacaca gctcccaggc ttcagtaagt aatcatgtag 180
tgggttgttt tttttctgtc cctgagaagc tgggagtagg tccttggatg cattacagat 240
caagagacaa aatggaacag taattatgat tctgaaattg ctcataatta gatccacagc 300
caggcagtct cactcagatt aatgagactg agtttctgat tcccagtggc ccataggtca 360
gtgaaggttc aagaggtgct aattagatca atgagttttt ttagttattc atttgataaa 420
gcattgcatg gcactgtgtg caaagctctg agctaggtac tgtggctgat aaaggattac 480
tatatagtat gaatctgtgt ttaagaaaaa gaaccccccca gaacctgatt gcctggggat 540
agaatccnat ctttgntcaa gttgaatgat gaagaataag 580

<210> 729
<211> 278
<212> DNA
<213> Homo sapiens

<400> 729
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gatcaataaa ctggctcatc tggtcttgng gcctccatcc aagtaccaac tcagtgcaag 120
aagacagctt cgaccccgta tgatttaatc tccaacctga ccaatcagca cttctactcc 180
ctggcccccct acccaccaaa taatcctcaa aaaaacccag tctccaaatt ttcaggaaag 240
actgatttga gtaataataa aactctggtc tcccgttc 278

<210> 730
<211> 700
<212> DNA
<213> Homo sapiens

<400> 730
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gggaggacct ttttcaacga cnctggtttg ntttgtggcg tttcctttgt gggaaccngn 120
ngntcttttt ngttngtgag aaanttcngn gattccttgg aattttcnct tacttttnct 180
ttgcntggtg natnccttta ttgggtngcc gggctgggan tttttttttgc tttttaatnc 240
nattgtggtg gtcttcnaaa ngaaaaccnc ttttagaagg gcaaanaaag gcccaaaaaa 300
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caagccangg ggccaaaggg gggacccnan aaaccccgct caaaggccca nccaaaaaaa 420
ccttnggcca aaggcccacc caangggccc nagcnnanaa gggggaaaaa gaaaaanttg 480
gaccttttgn aagggaaggg cttnccttgg ttgttnttgg aaaaccgggc angttggtat 540
tttttaccaa ccaaattatt gttttcccac ctcttctttc cctttgnctt tctttttttt 600
gggaaatggg ggtttttcnt tttttcccat tttttcattt tacccaccct ttttggcntt 660
tgggnaaaaa gaaattgggg atttaaattg ggattttctt 700

<210> 731
<211> 353
<212> DNA
<213> Homo sapiens

<400> 731
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gaactcccgg ctcaagcaat cctcccacct ctggctactg agtagttggg attgcaggtc 120
aagccaaaaa gtgatcggcc attcttttac cgggttccag ccaactctgt ccgctaaccc 180
ctatgacaga ggagatggga aaataattga gctgctacct aggaaggcac aaacatttcc 240
tgtggtgagg acttaggaag cagtgccagg aatcgggcca tcggaaggcc taagcacact 300
gggcacaggt tttctgcccc tagcaaggga ctgacaataa agtcaagtga agc 353

<210> 732
<211> 266
<212> DNA
<213> Homo sapiens

<400> 732
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tcaagcaacc agacatcagg ttccactact atcttcttca gaaaagctat ccagatcaaa 120
gcagaagccc aactctcttc tgctgcgttt caacagggac tgcttacgtc cagatcatcc 180
cagaggattc ctgtgttagc tctattagtt ctaccttcct tgagaactgc tacatagcta 240
ccattcaata aaataaatct cagcgt 266

<210> 733
<211> 679
<212> DNA
<213> Homo sapiens

<400> 733
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ctgaatgtgg atggacagtc attctagggc agaagccatg gaaatccaag gactggactg 120
aagaagatct agatgccgca tctctaggct atccgtctag gctatccggc tgagacaagg 180
ccttctgcag cccagctcac atatggtata tttcagccag cgagagctca actaactgca 240
gaacatccag cactgcatgt catatcgtgt cacccacttg ctgagggcaa gcccagcatg 300
gtttggtctg aagctgactt gaagagctga gagttcaaga cttgtcactg ggtcccaaaa 360
aggccctgtg agcctggagg cagagcccag tcctgtctca accaccaggc tcaggactgg 420
gggctttccc gaggatagag tnacacccgc gcgcgcacac acacacacac acacacacac 480
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aaaagaacat atagggtgct tnttctgcaa gctgcactgg cctttcgcta ccccaaaacc 600
tcttctattc agggagtccc tntntgggnt gggagcacca acactggtct taanaactcc 660
ctggcattac tttttccaa 679

<210> 734
<211> 375
<212> DNA
<213> Homo sapiens

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<400> 734
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cgcttcccag gttcaagtga ttctcctgcc tcagcctcca gaagaggtgg gattagaggc     120
atgcaccacc acacttggct gatttttgta ttcaccatct ctaccaggcc aggctggtct     180
tgaactcccg acctcaggtg atccacccac ctcagcctcc caaaatgctg ggattaaagg     240
cgtgagccac catgcccagc tgctcaacat ttcaaacaga agtttaatta tgaaaagaga     300
attaaatggc aatttttacc agtaagacat aagcctaaca tcattgactg agagaagtaa     360
atgctgtcaa aagat                                                      375

<210> 735
<211> 232
<212> DNA
<213> Homo sapiens

<400> 735
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tgtttccttt cactgaccgt cccgccacga ccactcctgg gctgtaaatc ctcacttgtc     120
cttgctgtat ttggaatgga gtccagttct aaggttcaag agttctaaga gtcctgaggg     180
ctcatttctc ctattgaaat agttcctgag taaaatctgc ttttatggct ct             232

<210> 736
<211> 571
<212> DNA
<213> Homo sapiens

<400> 736
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cttgtgccag ctgttgaggt tgtgacacct gtgccagcat cgccggctct gcccactgtc     120
atctgttcca actgttccat ctgcactgtt tgtaccaatt ctcccatttc tgcatctgca     180
ccttctgcag aaacgtttcc aacaatgcca gctgtgtcat tggtgccaaa tatgccagat     240
gttctatttg tccaccctgg gccaaatcaa tgcagttttg tgctcattag ttttagctgg     300
tagattctat tttacaattt tttgatttgn attttgattg aatccaggca aaatccccct     360
ttcaaagatt ttgtgtctat ctatccatct ctttgcaacc ccaactttat atctgacaac     420
atgaagttgg tcaatgttat tcccgatctt attaaaccan cccaatatta agtgngggta     480
ggggcatttc ctacccgtgt nagactatat atcgcaaaaa ccatgcaaca tagggataag     540
ttggcaaaag tnanttaaaa aagaatacac t                                    571

<210> 737
<211> 468
<212> DNA
<213> Homo sapiens

<400> 737
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agtgatcaag aactgaccaa gcttgctcat cccaagcccc cagccacaag caatagggga     120
tcccggtaaa ggtttgccga cctaagctgg tngtgatgaa gccatcaaga tgatccctct     180
ttctgtttgg agggtgctaa atccggcagg ggccattgaa gcctgggatt tactaagcaa     240
gaagccttgc cttgaaagat gccaccaagc acaagaagat gggccaaaac canaggagcc     300
taagaagaag acangaatct caagttgatg atatcttgaa gccatccaag aattccagcc     360
caccatcttg aaagtttaaa aagtcttgct caagggactc ttgagggtac aagggaaggg     420
taatacattt ttgtatcaag ggaaattgga aagtgggggc ttcttttt                  468

<210> 738
<211> 146
<212> DNA
<213> Homo sapiens

<400> 738
acccaggtga ccgctcacct ccccttcctc ctggagcctt gaagtcggag gccctgagcc      60
atggacggta tctgaggatc ggtttagcgt atctggccgg agaaattggc aacatttgct     120
acgaataaaa cccaagcgtt tccagc                                          146
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<210> 739
<211> 693
<212> DNA
<213> Homo sapiens

<400> 739
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ataggacaag ctcatttcct gagcttgtag ccgcagaatt gggccaggtg cttttaatcc 120
tcacagctgc tctgcaagcc tttgccctgc ttactagact gaaaatcatg ataaagctga 180
gactttccct gactcacctt tgaatcctct atgaatctgc cgagctaaga agaccacctg 240
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tactctgtgt gtgtgtgtgt gtgtgtgtgt gtgtgtgngc cctctcttgc acactttgca 360
aagcttgaaa anggaagtan gcantgacca ttttatatat tgganaccag cgtatatggg 420
aaantgangc attaagaaga aatataacnt gctttaaact acacatcaac tgnantggca 480
naactcggag ntagatggat gagattntgc cccacaaga cttacaaggt gtntgngaag 540
gngttnctgn aagaaantan catttnaann canctgnngg gagnaaanaa aaacccctnt 600
gncatngnag nnggggcntn atccancccg gngngggggc aaannnaaca aacanngggc 660
nnngggaaaa gcnannttt tttttaaagt ttg 693

<210> 740
<211> 181
<212> DNA
<213> Homo sapiens

<400> 740
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tgcngcanca agacaccntn ttggaagcag agcagccctc accagacacc aaatcggcca 120
gcccattgat cttagacttc ccagcctcca gaactatgaa aaataaattt cttttgttta 180
t 181

<210> 741
<211> 689
<212> DNA
<213> Homo sapiens

<400> 741
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ctaataacac gggaaatgag gcttcagtgc tcaacatgcc aacatgcttg gaaattcttc 120
aataccatga cctctaaaag cccagctaat ttagtgaaaa gagaaacaag ggtcctgcat 180
accaatgaaa ctgctgacat cagctgatct gaatgaccca acaaaaagct tacatacaca 240
aagaatgcag ttttcacatc ctaatcattt cattctcctt accctgacca atcaatgatc 300
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ttggggagat ggattttggt gttttctgcc atctccttgc ttggctgtcc tgtgatcttt 420
aaacactttt tctgctgcaa ccctgctgtc tcagtgtacg gatatgttac tgtgcagagg 480
gcatatgaag ctgttggcct ataatattat gatggcatta gtggccttat aagaattaag 540
aagagaagcc nggcacattc gcacgcacct gtagtcccag ctactcanga ngctgaggca 600
ggaggattgc ttganccccca ggagttaaag gctgcagngg gctttganca tttntttgan 660
nanccactgn actcttacct gaacaacca 689

<210> 742
<211> 401
<212> DNA
<213> Homo sapiens

<400> 742
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gttcttacca ttgaaaaaga agtgctgagg ccaggcatgg tggctcacac ctgtaatccc 120
agcactttgg gatgccgagg cagctggatc acttgtggtc aagagttcaa gaccagattg 180
ggcgacatgg tgaaaccccg tctctactac aaatacgaaa attagccatt gtggtggcac 240
acgcctgtaa tcccagctac tcaggaggct gatgtgggag aactgaaccc tggaggtgga 300
gattgcagtg agccaagatg gcgctactgt gctccagcct gggcaacaaa gcaacactat 360
gttttaaata aataaataag tgctgagatc tcagaaaata c 401

<210> 743
<211> 446
<212> DNA
<213> Homo sapiens

<400> 743
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ccagatggcc tgaagtaagt gaagatccac aaaagaagtg aaaatagcct taactgatgg 120
cattccacca ttgtgatttg tttctgcctc accctaactg atcaatgtac tttgaaatct 180
cccacaccct taagaaggtt ctttgtaatt ctccccaccc ctgagaatgt actttgtgag 240
atccaccctc tgcccgcaaa acattgctct taactccacc gcctatccca aaacctatag 300
gagctaatga taatccacca ccctttgctg actccttttt cggactcagc ccgcctgcac 360
ccgggtgaaa taaacaacct tgctgntcac accaannnnn nnnannnnnn nnnnnnnnnn 420
nngggggggg gggggggggg cctttt 446

<210> 744
<211> 500
<212> DNA
<213> Homo sapiens

<400> 744
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agtggaaagt gggcaaggcc aaggtcatgc tacagaatgt gactgagcaa caggggggatc 120
acttcagctg ggatgggaaa ggaaagcctc caggaggagt tgacatcgaa tcacagttga 180
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catcaccagg atcctggaga cgagatacat cctcagctta ngaaagaaga cggggattaa 360
agaagattaa aaggacccng gnctttcgga aaaacttttn aaaagtcctn nntttggnag 420
gnaanagnna aataaaangg tcccatggna aatcttttcc caaatttant tntttcaaaa 480
gactngcagg taaaagaaca 500

<210> 745
<211> 495
<212> DNA
<213> Homo sapiens

<400> 745
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tcaggagttc gagaccagcc tggccaacat ggtgaaaccc catctctacc aaaaatacaa 120
gaattggccg agcgtagtgg cccacgcctg taagtccaac tactcaggag gctgaggcgg 180
gagaatagct tgaacctggg agacaaaggc tacagtgagc tgagattgtg ccactgtact 240
ccagcatggg cgacagagtg agaccctgtc ccaaaaaaca aaacaaaaca aaacaaaaca 300
agacttattt caatggactt gtcccctctg tgtcatcatt caatcatctc tgtaagttaa 360
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aaagtancaa aaaggggaca cctgncantg ggggaaggat ttcaaaaaag ttccccatgc 480
ccttcatgaa gtttt 495

<210> 746
<211> 469
<212> DNA
<213> Homo sapiens

<400> 746
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gggtttaagc aattctcctg cctcagccac atggagtatt gctctgtggc ccaggctgga 120
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tcacgtgacc tctcctttgt gcacaagagg agagagtgag caagtgaact cttggtgact 360
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ntaaatacct natttaaacc tggctccaaa aacagcccat tggactttg 469

<210> 747
<211> 469
<212> DNA
<213> Homo sapiens

<400> 747
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ggactatgct taacccattc ccagcttata aaagccccat ggcagctgca gtgaagcatc 180
agattatgtg atgcaacaaa attcaaatat gaaaaccatc ttggaggccg ggcgcggtgg 240
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ccagcacttt aggaggctga ggcgggcgga tcacctgagg tcgagagttc gagaccagcc 360
tggccaacat gaanaaactc catttttttc ttaaatacca aaaatttncc cgccttgggg 420
nncatgcctt gtattcccac ntnctcggaa ggctgaggca ggaaaattg 469

<210> 748
<211> 79
<212> DNA
<213> Homo sapiens

<400> 748
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aaacanaatt taaaaagcg 79

<210> 749
<211> 251
<212> DNA
<213> Homo sapiens

<400> 749
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caaatttcct ggggcttcaa aaanaccttt tttttaaacc ttccccaanc aagctggggg 120
aactacaagg cgggggccnc cactttgaaa cctcgggctt aatantggga aggtaattta 180
ctaaagtatc ttgnaaaaat ccttaatcca atattaaggg gaaaaataaa agggtttttt 240
taaaatgggt t 251

<210> 750
<211> 487
<212> DNA
<213> Homo sapiens

<400> 750
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ccccactgga aacacccacn ttgaacaact attcacacaa agaagcacct tngtaagaac 120
caaaaatcag gngccagaca gaaagnnatn tntntgctna actganacaa atgcacnatt 180
cattgagcca gactaaggca taagngacta ttcctctatg ttccccaaca tgtaaattgt 240
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cctggaacca caccttatct anctggaact gtcccctccc cgccccncca attctgncnt 360
gttttgagag ntcctgcctt tctggaccaa attnatnggc cttttnnacc cangggggggg 420
gngggggaaa atttccctaa aagggggaaa agggagcggt nccctgccnn cttgagcaca 480
tgttgcc 487

<210> 751
<211> 148
<212> DNA
<213> Homo sapiens

<400> 751
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agccctcacc agacaccaaa tcggccagcc cattgatctt agacttccca gcctccagaa 120
ctatgaaaaa taaatttctt ttgtttat 148

<210> 752
<211> 455
<212> DNA
<213> Homo sapiens

<400> 752
cttccagagg ctgcctgcat cacttgcctt ggggcccctt cctccatctt caacaggagg 60
ttgagttcct catcacataa catcactcgg accttgtctt ctgcctcgct cttccacttc 120
taaaagcccc agtgattaca ctggactcat ccaaataacc caggatcatc atctcctctc 180
caggatcttg ttctgcggcc caggctggag tgcagtggct tgtggaaaac tgaactcatc 240
tttataattc ctttttttatt gagacttacc tagaataatt aacatttgaa tttaattaaa 300
aacagttctt ttgtcaaact taacccaatt ctccaatact tttgtaggtc accttcttta 360
ataacaatca gaggaagaat tttctgactc tttaaaaaaa aganctaaaa aaanaanctt 420
tatngccanc acataangcn tttttttcg ggccc 455

<210> 753
<211> 433
<212> DNA
<213> Homo sapiens

<400> 753
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aaaaggaggt ttaatggact tacagttcca cgtggctggg gaggcctcac aatcatatca 120
gaaggtcaca gctgatgcaa gaggcaggct cccacagcct tgagcagctc tgcccctgtg 180
gctttgcagg gtatagctcc attcctgact gctttcgtgg gctggtgttg catgtctgtg 240
gcttttccag gcacacagtg caagttgttg gaagatctac cattctagcg tctggaggat 300
ggtggccctc ttctcacagc tccaaattat atgctggata tacaagagac tcatgaccca 360
aactgggaca acaggaatgg ctttctggga naaaanaaat ttgggncccc aacccngaaa 420
aaaaaaaacc cgg 433

<210> 754
<211> 74
<212> DNA
<213> Homo sapiens

<400> 754
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gattaaagtg cttt 74

<210> 755
<211> 390
<212> DNA
<213> Homo sapiens

<400> 755
atgcatttgt cattgaagaa aaacatctta caaaggaagt ttaaaagaga acccagatga 60
atatttcttc agatgaacca caaataagtt ctgatttcaa catgttctac aactccccag 120
agctgagaag ctaaagacgg ttctacaata tcatattcca aaggcatcac agggtttagc 180
tgctaatgca ataaagtggt ttttgtcttg gaagcacgca acatcatgaa taacattgtc 240
atctggaaac aatgagccaa taggcaccat tttgtgttgt aaccgagcag gcttgcttga 300
ttgtggatgc agatatgccc accctacgta agttgacatt ttgtacagac tagaagaaat 360
gtgtggtatg agatcaataa agaagtaact 390

<210> 756
<211> 149
<212> DNA
<213> Homo sapiens

<400> 756
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cagccctcac cagacaccaa atcggccagc ccattgatct tagacttccc agcctccaga 120
actatgaaaa ataaatttct ttcgtttat 149

<210> 757
<211> 447
<212> DNA
<213> Homo sapiens

<400> 757
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taatccacaa actgaaaaaa tgagattgaa tgaattcctc tttcaaaggc aaagaaaagt 120
taaacagtgg cttctacaag aaaggtgaac tccttataaa tgaaaaaatg acctttgctg 180
catttgaggt gttgtctgtc aacattatcc gtccctttg agggtagtgt catctgataa 240
catttttgag tcatgggaaa tttccggaaa cagaacagca cacagaaagg actgacctat 300
ttctcttaga gtaacatcct cgtggctcat ccacgagaaa ggaccttgaa accttgaagt 360
attctgtggn atcctgtgng tacacagntc ttttttaaa anaactttaa nacctttacc 420
ttnggnggct tgnctttaaa gggaaaa 447

<210> 758
<211> 472
<212> DNA
<213> Homo sapiens

<400> 758
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tctgactgcc tccaggcata cagccagaac tcactgtgtc tggacgggcc tcatactaca 120
gcctccaccc cttccaacct cctctgcgac agactgtggc tatgttcttc ctgctgaaca 180
ccacctctgc cctgatggct cctgcaactt ggacaaagtg acaaggtgaa gttcaggagg 240
ctctgtgttg ctgaagaatt ggccttgagg ttatttcatg cctgaatgac cagtggttta 300
ctaccagaat catctggctt cctgcaagga agatttgggg cttggtatct gttcccctct 360
cagactcagc agacacctaa ccaccgctga aagtcactga aatcggatnt ttnccttcnc 420
aaaaanggnn tcttnanntt tggattcncc aaagggacag aggaaaaggg gg 472

<210> 759
<211> 423
<212> DNA
<213> Homo sapiens

<400> 759
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ggtctctaat ttggaatacg tcctctagca acgacctgag gcttaacatc tgctgattct 120
gtgctactgt aagatagttc ttagtttact gggtctgaaa agcaggtttc tcttttaacc 180
tctgggattt cttaacagtt gctaccggtg gtatgatcac ctgatgatgt acttttagcc 240
aactgtgtgt catcaatagg ggtttgtctg ttttaaagaa cattcaaaga aaaggaatgg 300
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cgggaaaagg acgtgcattg tggangaaag gggggcngct gtnaccnttt taaaaaccct 420
ttt 423

<210> 760
<211> 465
<212> DNA
<213> Homo sapiens

<400> 760
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nactntnact ccgtngccta cactggagng caggggngat catagntnac tgcagcctcn 120
aactccngag ctnaagngat cctctngctt naccttcctg antagctggg actacaggct 180
ngggncacca tacctactat ttttnatttt ttatgganac aggctntcan tatgttgacn 240
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ggattacagg cntgacccac ctcgtntagg caaaaaacag ctnaatggtt ccagtctttc 360
agtcctgctc ctggccaaca ntggaccttt naaaggttaa ccaagttctt tttcagggcc 420
gttggnaaaa aaaccccctta tngttggaaa ccaaaaaagg gggtt 465

<210> 761
<211> 427

<212> DNA
<213> Homo sapiens

<400> 761
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atagccatga agacacaacc acagccttca tggtattctc cactcctgat cttccagctt 120
aatatctgga ctaacaagaa acttaggact ctgaccagat gtaaaattaa catgttttgg 180
aagcggcaga gtaatgccca accaactttt ccccaacatg gggcataaac attgtaacat 240
ccagtccaaa tgtcaatcca gtttctcag agataactgc tctaatataa gaatgtgtgc 300
ttgtacagag tttgtgatgt gaatatgtaa attttattta tgccataatc tcactacagt 360
acatcaaaca gagatgcaga atgntacaaa ttcttcaact anacagnttn gggcaggttt 420
cacaaac 427

<210> 762
<211> 435
<212> DNA
<213> Homo sapiens

<400> 762
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ccgggttcag gctattctca tgcctcagcc tcctgagtag ctgggactac agttcacagc 120
cgcggtggcc tccagcctga ggattctcct gatacatgct actaagggct cacctgtgct 180
tgccttctcc ctgggagctg tcgactcaca gttaactctg taggttgaat acatgccatc 240
tgctctactc cctgttcaaa gccactcagc cataaaggaa taaaatagga agaagcgaat 300
ggcaatggag atgcaaaaag tgtcaacaat attttggaag acataagttg tttggacaaa 360
agacttcgaa tttaacgtca gctttctcca ttctgctgag nggctattcc tggagaaanc 420
cattaaagaa taatt 435

<210> 763
<211> 202
<212> DNA
<213> Homo sapiens

<400> 763
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agatcattcc ttccatccca gaagacccctt catgcacctt cccagtcaac actccctact 120
tcaagacagc cactgttctg gtttctttca tcaaagataa gttttcccag ttgtagacct 180
tcaaataaat gaaatcatac ag 202

<210> 764
<211> 292
<212> DNA
<213> Homo sapiens

<400> 764
agatggatct cgaactcctg ggctcaagcg atcctttcac cttggcctct caagtagctg 60
ggaccacatt tgctcaccag ctggcccaag accagactgg gcaacatggg tcatcctcct 120
ctaagattcc aggaccatga tcatccctct attgctactt cttagatcag cttgtaatgt 180
ccatctcccc caccagactg cgtctccagc atctctgagt ccccagggcc tggcctgggg 240
cttgctacat ggtgggtgct cagtaactgt gaggtaaata aatgaatgaa tt 292

<210> 765
<211> 121
<212> DNA
<213> Homo sapiens

<400> 765
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agtgtacctg aaattaaaat caaattgtct gattccttca aaaaaaaaaa aaaaaaaagg 120
g 121

<210> 766

<211> 528
<212> DNA
<213> Homo sapiens

<400> 766
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atgacaaaca ccnaaaattn ctactcagtg cacttacatt gcgcttacat attctggcct 120
tactactgtg ggcggcgngc ntcaggtcga aaccttctgg cttnnttgcg ggactccttc 180
tggntgggca attgcagaca cttgttgagc aaatcatcaa ggggagcaag caagtgtaca 240
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tgccgccgtg cgttgctcat gtgccgtgcg ttgtgcgggc ttcacttttc gggcttcaac 420
gcagttttga aagaagcaga agccttggaa ccaanangaa tctcaaagta tgtggtngct 480
tgcaaaaccc tttcttcgct tggcctgnaa naaaatccaa gggactct 528

<210> 767
<211> 309
<212> DNA
<213> Homo sapiens

<400> 767
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gaaccaggac tcccatagtc tctctctggc ctctgtgctg tctggcaaac agccgtgtcg 120
ccttggcctc gaaccctgga gcctgcctca ccaggagaca gaatcaagga caggggcctc 180
gccttggcac caggtggccc ttcgtgtgcg tacataaaca cttttcccag gatatgaata 240
aggtccacag gcactcggga ggaatgggtg tgttgcgatt tacggtcaag gagaccagga 300
tgtcattgc 309

<210> 768
<211> 384
<212> DNA
<213> Homo sapiens

<400> 768
agaagaaaaa ggcctcccac agagaatggc caagccaggt cactgctatt tcccaacaga 60
aatgaaaact ggaattgagc catgtggaaa gatggaccag gccacaagaa ggtcttcggg 120
acaaccctga aagaggtgac ccagggagac agagtccagg gtcctttcaa atcactgctg 180
gcaggagcaa agatcaagat aggtgaaacc tgatattcaa atgcaggcgt ggaaaaagaa 240
taggcacagt ggttcataca tgtaatctca gagctttggg aggccgaggc aggaggatcg 300
tttgaggcca agatttcaag gctacagtga gctatgattg caccactgca ctccagcctg 360
ggtgacagag caagactcgg tctc 384

<210> 769
<211> 368
<212> DNA
<213> Homo sapiens

<400> 769
gagaggcaac gtttcaccat gttgaccagg ctgcacgggg tccattttttg tgctcaccgt 60
tattcctaca gcctcacaga atcctggaca caaagaaaga cttaacaggg ttcattcatt 120
cctgaaccaa agcggctgaa cgatgtcaac aggaccagag aggctacagg aacgccatat 180
tttcttctac atctcttttt ttaaaaatct tatttcaatg gagtcaaact caataaggtg 240
aattaaagga aaaagagctg acccaaacaa acaagcaaac agaaaccttt tctgtcctgt 300
aatgtttagg cgcaagataa gaagtgcaaa tanagaagtt taaaaagcta attaaagggg 360
tttgtttg 368

<210> 770
<211> 439
<212> DNA
<213> Homo sapiens

<400> 770

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cacgtttatc ttcgacttcc cggtcgtcag aactgtcatg catgctgtta ctgatctgct 120
atctcatctt gtcggttggc atatggcagc agagccaggc ctgcagctcc tccagatcct 180
gatggatctc cttcagcatc tcagaagcct agattaggta catgtaccag ctgtgcagct 240
ctacctacat ggtaggtaag cctttccata aaagtgaaga aagccccgta tgaatttttt 300
caatgaatca agactctgta taaaatcagt tggctaaaag gagagcacat ctgctcactt 360
ctgctgttta tgcaacatgc tacagaatga atttaaaagc caaacttttt attaaaatga 420
caaaattgag acaaggaac 439

<210> 771
<211> 211
<212> DNA
<213> Homo sapiens

<400> 771
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gacttcctgg gctcaagtag atcctcccac ctcagcctcc cacatagctg gaactacaga 120
gtttactcca ttgctgactc ctcattgaac actttgctgc accaacccaa ccaactcaga 180
gggttagaga attgtttgag acccctccta c 211

<210> 772
<211> 477
<212> DNA
<213> Homo sapiens

<400> 772
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gaattttcat cggtgatcat gactgccacc cctaccgcgc aatttcacaa gtgggctctt 120
ataatcccac aacagccctc tgacagaggc actgttatca ccccgcttta aaggagagga 180
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tcgggaaact gaggcaagag aattgctgga acccgaaagg ggcaanggtt gcagtgagcc 420
gaaaatcacg tcatgctctc tagccctggt gacagaacaa gacttttgtc tcaaaaa 477

<210> 773
<211> 567
<212> DNA
<213> Homo sapiens

<400> 773
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ggaanaaaga aaaagaangc accaactctg caaagttctn tggaatctgg gaagtcaagc 120
ganggcttnt gccttnttca tggtgaccct tttgagcaag ttcagcctgg ttaagtccaa 180
gctgaattgg cctcgctggc ctatattgaa ttctatatgg ggcccgctat ngggccaaat 240
tcttttggct ttttaccctg gggaaagaaa atactcatta aagccacctn ttgttattta 300
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gtgcccccgc ccttacnact tcnatccccc accttaccnt ttggtcccac ttcttggncc 480
ggncnacaag ntttcaagtc canggtccnt ccatnccttt ttctttccac tttcatttaa 540
cccacctaaa agaaaaagcc cttcctt 567

<210> 774
<211> 294
<212> DNA
<213> Homo sapiens

<400> 774
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ttggagaana aatgagattt ctttgncnag gaaccagccc gncctttttga gcaagttcaa 120
gcctggttaa gtccaagctg aattggcctc cgctggccta tatngaattc tatatgggcc 180
ngctattggg ccaaattctt ttggcttttt aaccctggga aaggaaaata acttcaataa 240

aggcccnccn tntngttttt aaccccccat tcttttnana aagaaaaaaa acgg 294

<210> 775
<211> 217
<212> DNA
<213> Homo sapiens

<400> 775
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gctggctaga atgaaaagac aaacattccc ttcaaacagt atgccattgc ctaataattt 180
tgcaagctca aatgaaatcc aaccaaattc agaattt 217

<210> 776
<211> 191
<212> DNA
<213> Homo sapiens

<400> 776
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ctgctgggtg aacaccctcg ccaaagaagg agactgcaga aatcctcctt gatggtatca 120
gctcactctc tcttaaatgt tcatccactt ttaattattt acaactaata aaacatgtaa 180
taacacggtc c 191

<210> 777
<211> 284
<212> DNA
<213> Homo sapiens

<400> 777
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tctgaacagc aggctcaact gtctaaaaca ccttttctaa agcatgaagg aggctgatgg 120
ccatgtcaac gttttcctca agatcaagga atcaatcctt tacgttgtgt aatgaaagga 180
ttcattctgt tgatttcccc catacaaatt atgtgttcca cagatgaatt tctgcttcaa 240
cctctcggga ggcttaataa aaggccttga ggctttgaaa tgac 284

<210> 778
<211> 102
<212> DNA
<213> Homo sapiens

<400> 778
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cctgatgtnn agtcttgggt gcgactcata ccggcctggg aa 102

<210> 779
<211> 369
<212> DNA
<213> Homo sapiens

<400> 779
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aagagcttcc cctctaggct ctacctgaac ctcactctct tcgggaatca gaagataaat 180
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gacacacacg gtttttcaca cttggacatc tctgaagctg ggatgtatc ttataatcca 300
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cttcaaaag 369

<210> 780
<211> 174
<212> DNA

<213> Homo sapiens

<400> 780
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ctcactgaat gcgtcatcac gcctgatgaa gcacaagaga aaacaagaga aactgaagat 120
catctatatt tagtgctaga aaagaatcac aaataaatat taaaatacac actc 174

<210> 781
<211> 359
<212> DNA
<213> Homo sapiens

<400> 781
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ggaaaaanaa actttncntt cattggantt ggaatggann agggcggtca gtttgaattt 120
gcagggnctt gccttgcggc ccatgggaaa gggcttgccg aggactggaa nctaccaagg 180
agggaggcag aggacaccgg atgtgggtga aaatacgggc cctaacacat cattttganc 240
cttggattca cccctgcctg gccttgaaac caatacatta ggccccaaat atattattng 300
gaatatatat atttnggaat atggtgtatt tagaanccaa tttattagaa acccaattt 359

<210> 782
<211> 194
<212> DNA
<213> Homo sapiens

<400> 782
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acaaacttca tttttaaaac aatctacgtt gccttgtttt atgtntaaga tccaaangtg 120
ctagacnagt tctttattgt caatctacca tgtgtgcgac cancaacnnt taaggatgac 180
ttttgttaaa tatc 194

<210> 783
<211> 390
<212> DNA
<213> Homo sapiens

<400> 783
gtggcaaccc tgcataaatc aaatctatca ancaccattt ttccaacaac atatgctcac 60
ttttcatntg ggtcangcat tttttancaa tattttaaaa ttaagatact gccatctttt 120
gcaaattgaa ggtttgcgga aaccctgcat ggaggaagtg tatcggcgcc atttttccaa 180
cagcatgcgc tcactttgtg tcttttttca cattccccta aagagggaaa cagcacagga 240
ctgggcagtg caatgcttcc atagtgcacc tcattgcatg gaccgttccc ctgaggctgg 300
tgggcaagcc agcgccaagc aacccactct gtgatcaacc cactccccat gggaagtctt 360
gcccttggtg gcaagtgttt ccatagtaaa 390

<210> 784
<211> 399
<212> DNA
<213> Homo sapiens

<400> 784
ctnacntntn nagtccaact gagnannaan gcattggtct nganggagng aaggnnattc 60
cctnagaggc cacaaaccag ggaacgccan gggcggctga agctaccaga agagccagga 120
gaggaaccag ggatgggttc tttgccttac agccctcaga ggcgccaacc ccgctgacac 180
ctggatctcc attcctagcc tccagaactg tgcaagagta ccgtttctgc ctctttctgt 240
aggaaaccac ccagggtgtg gtgatttgta tggcagcccc cgacactctg gcaagctcca 300
tcccagcgtc ccctcctccc atcagctgtg acctcatgtt cctctcctgg actctgttgg 360
actcatggca agaatatctt aataaacgca tgttaaagc 399

<210> 785
<211> 117
<212> DNA

<213> Homo sapiens

<400> 785
gactctggga gctcctgctt ananctnnnn tgttagaatt ggaagctaaa gctaccaaag 60
acgtagaaag aaatcttagc agggatttag tgcaagaaga agaacagttg atggaag 117

<210> 786
<211> 262
<212> DNA
<213> Homo sapiens

<400> 786
gaagcccctc tggatgcagt ccaccagaga ggagcagtcc attatcaaag aagattatgt 60
gggctggaga cccaatgcag gagggaagca gcaggagttt ctgggaggat ggcagaggga 120
gatgacggga taactgcact ccaggtggca aaagcaaccc atcctgacag gacagtgtga 180
cccaagagcc atgcacagta aggggtatca tcgccatgcc ctctgcctca tgcaatctta 240
aataaatatg aatatattca ac 262

<210> 787
<211> 513
<212> DNA
<213> Homo sapiens

<400> 787
gnnggaaagc tagncgnncn tgnannncga gtgctggagg aagnctgnan acatctacnc 60
cacacanaan naagncnatn attnacaggg cattttacta atnanangcc atgctgggnn 120
ngcagnggtg cantttngnc tnactgaann ctctgantgg nggggtcaac gatccctccc 180
acctcagcct cccgagtagc tgggactaca gaaattattc ctttgcaggt ggtgcaaagg 240
atcagcacgg gagttttgac ctgctccgtt tccgacctgg gtcggttcac ccctccttag 300
gcaaccctgc ggttccccgc tccagggagg tcaccctctt gatgctgaat ttagcacgga 360
cacctgatgg gcacagtgca ctgcagccca gagctcctga gctcaagcca tcctcctgcc 420
tcaacctnca agtagccagg accacaggcc ccccccttgn ggggaagaaa taccaggtgc 480
gcatgcttca anaaaaagcc gctgaggacc cgg 513

<210> 788
<211> 284
<212> DNA
<213> Homo sapiens

<400> 788
gaagccaact ctcagggtct tcctccgctt ctgttctctc atgccccttg gtggaggctc 60
ccagatggac gctcagacac ggaaggtcca gggagatgcg tggatctgcc gccatgtggg 120
tggaccaagc tgttgcctcc attggaagcc tctgtccggt gccacatcct ccctgggttc 180
cagtccccac ctgccaggtt gacaattagg caatttgatt tactaaggag aagacaaaga 240
aagaaaagga gaaatatttc aagaaaaaaa agactgtgaa aaag 284

<210> 789
<211> 400
<212> DNA
<213> Homo sapiens

<400> 789
ctggggagct cctgcattaa nncnganttg ttgganntgt gtnacagana aagactcggn 60
gaatgccnca canngatgaa ggcangtgat gcatctacaa ggccaagaaa tgtcaaagac 120
tgcctgcaaa ccaccagaag ctaagagcaa aagcacaaaa gcgattctct ccccacagccc 180
tcagaaggaa ccaaccctac agacatcttg atctcaggtg tggagcctcc agaactgtaa 240
gacaacaaat atctgctgtt ctaagctact tagcttgtga taatttgtca aggcaaccct 300
aggaaataaa tacagggaac ttcaaaaaaa aaaaggcngg ngnggncnnt naanttnggn 360
nttancnagn cngantttgt tnaaaagggg gggggggggg 400

<210> 790
<211> 432

<212> DNA
<213> Homo sapiens

<400> 790
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aggtcatgaa agccactgaa agactgagaa ctgttccaga aaggagacta gagagacatg 120
gcagccaaat gctccacata atcctgtcct ggattcttct cctacaaagg aaggggtctg 180
aggattaggt ggtagtactg aatcaaggaa ctatcatctc ctattgtgct gtaggatctt 240
ggcagccaga ccccagctcc cactttccct gaaagctccc tttaatgaag ctgaacgctg 300
tcccagcaat tccctccaca gaagacctac tgtcaccacc tctggagggg caattcctgg 360
aggaaccaag tcagccaatc gaaggtcctg aataagcaaa aactaagtaa ataaattacc 420
atctcgaaag tg 432

<210> 791
<211> 520
<212> DNA
<213> Homo sapiens

<400> 791
gtgactagaa gcatcagggg acctgcccta gacacaccca gagggcagag gggaactagt 60
tccaaggagc aggttcaagc acatggtggg gaaaagaatg aagctgtttt ctccttgtgc 120
cctccaaggt tctcctctta caatatacta cttacctcgt ttctcctgga attctcaata 180
tcctgctagc ccagcaggtt gaaagatgtc atcagcacgg tgactggctg agatcaaatc 240
ccatttttgc acttaatggt ttgtaggaaa gtagacagaa tgctatcctc cacgtacctt 300
gattcactta tctgtacgat gtggataatc gtaggatcta cctcatggag ctattgngaa 360
gattaaccag ccacaaagat cttaaatcag ggtctagctc atggtaagtg ctcaatcaat 420
gatagcaatt tatcatcatn cctcttcant ggaanaccct gatgttcatc aaaaaattta 480
atgctcatta acctctaaag aaaaanggaa aggagaaaga 520

<210> 792
<211> 350
<212> DNA
<213> Homo sapiens

<400> 792
gtcctgcttt ctcatctaca actgaaggtt gcatctttcc ttaaaagcca ttaacggtca 60
tctactgtcc atggggcgga ggtggagctg attcatacag aatttgagaa tcttgccttg 120
cttaccatct aaagatgact caaaagcttc ttacatccaa atgaaacgtc tcacttcgtt 180
cgtaaagaat gtggcatctt tagggttgcc ttcacagtga cactatgaaa acctggatga 240
cagcaacggc ggtggcagca aagtaaagca gcaaagtaaa aaaaaatcct gttttgtaat 300
ctccctttgt caaatcaccc acctaactgg aaaataaatt cttaaacatc 350

<210> 793
<211> 409
<212> DNA
<213> Homo sapiens

<400> 793
gctatacaaa actggtggtg ggccagagtt tgatttctgt ctcctggtgt tgatgaaaga 60
ggctttgaga aaaagatgca ggaaaactca agacaggatg ccatgctgct tttggacatt 120
accaaaaaca gcagaagagg gagccccgca aaggggcact ggtatgacct ttatgatgga 180
gaagaaagtg attacccccct ttctgcctct gcagccacaa aacagatcaa aacctatttc 240
agaacaagct aacagactct aagaaaatta tgtaagacat gaaagtatgt gaattgttac 300
agcaatcaga aaagaattaa aaaatttaaa aatgcatttt aggagcaaag actaaacaac 360
aaataaacac aacatgtaat gccctaagaa aaacagaggg gtgaaaatg 409

<210> 794
<211> 276
<212> DNA
<213> Homo sapiens

<400> 794

cagnacctga gtggctaagc tcctacntcc tgttctggaa ggncnttcct gaccncacac 60
atgagccata tnctnttcat acngacantn tatnggtgag ggaaaggcaa catttggaag 120
gactggacnt tttaccttaa ggggatttta aaaaatcacc acaatggact attatcacaa 180
cntnggattc aaaatttatg gatttccctt ccttttggtt acccaaaagg tggacttngg 240
aagaaaaaga ngaagttggg agcttaaaat aaaccg 276

<210> 795
<211> 510
<212> DNA
<213> Homo sapiens

<400> 795
atggagtctt cctctgtcnt ccaggctgga ttgcaagtgg caggatctcg gcttactaca 60
acctccgcct cccgagttcg agtgattctc ctgcctcagt ctctggagta gctgggaata 120
caggcaccca ccttcgtgcc cagctaattt tttgtttgta tttttgtaga gaccgggttt 180
caccatgttg gccactctgg tcttgaactc ctgacctcag gtgatccgcc cacctctgcc 240
tcccaaagtg ctgggatgac aggcttcagc caccgtgccc agccaagatc aagttgttgt 300
tggcagggct gcactccctg caaaggctgt aggagacaac ccatctttgc ttcttcagct 360
tctaggggct tccgcagcat gccttggcgt gccttgcttg nggctgcatt actccaatct 420
ctgcctgnat ggcaaaatac cttctnctgg gccatctatc ttcctgnggn cacttataag 480
gacaggtatc attggaatta atggccctcc 510

<210> 796
<211> 255
<212> DNA
<213> Homo sapiens

<400> 796
atggcagctc tcaagatctg tccggaaaag tctagaagcc tccagatttc taatcaacag 60
actagcgctc ctcctctgta actgaggaac aagatgccaa ggagacagga gaaagaagag 120
aatncctttc tngtttnggc cntaacccnn gaancanant ngnccntgan cntngtaaat 180
aagttacatt tctgcagagg tgcttgacgt tcacaccgtt tggattgctt tattaaaaga 240
ctctttttag agccc 255

<210> 797
<211> 450
<212> DNA
<213> Homo sapiens

<400> 797
ttgaatacaa ggatgtggtc aactatactg ttcttaccgt tgaaaaagaa gtgctgaggc 60
caggcatggt ggctcacacc tgtaatccca gcactttggg atgccgaggc agctggatca 120
cttgtggtca agagttcaag accagattgg gcgacatgat gaaaccccgt ctctactaca 180
aatacgaaaa ttagccattg tggtggcaca cgcctgtaat cccagctact caggaggctg 240
atgtgggaga actgaaccct ggaggtggag attgcagtga gccaagatgg cgctactgtg 300
ctccaacctg ggcaacaaaa caacactatg ttttaaataa ataaataagt gctgngatct 360
tcngaaaaat aaaaggnnan nnaagnnggg nccnngnggc caattaacct tgggaattna 420
ccnggntgan gtttttttaa aggggggggg 450

<210> 798
<211> 206
<212> DNA
<213> Homo sapiens

<400> 798
ggtcttactc cagttgccca ggctggagta cactggtgtg atctcagccc actacagcct 60
tgacctcccg gactaaggtg tttctcccac ctagcttgat gactttattt gtgtactttt 120
ctgtattcca aatcctttgt aatgactatt gtaaaggatt acattatgga gctcaattat 180
ttaggaaata aatccctcag acactt 206

<210> 799
<211> 571

<212> DNA
<213> Homo sapiens

<400> 799
gacgtctggg gagctcctgc attaagtcag aacttgaann ggagcttaat ggtggccncc 60
aagctngang tgncaccggg aggatcttaa cttactggaa nctttngctt ccgggttcaa 120
gcgaatcttn nacctcaacc tnccgagtag ctgggattac agacgccccc ccttatgctc 180
ggntaatttt ccgantttg gaaaaaggg gnttcaccat tttggccagg ctggncttga 240
actcctgacc tcangtgatt cgcctgcctt ggcctcttaa aagtgctggg aatacaggcg 300
tgagccaccg ngcccaaccc aaacgtttat tttctaattt acaggtcagg gggaaagaaa 360
gntttatttt ggtttgcttt ttcccttgag gaactgaatg gtttctcctt tctgaattta 420
aaggaaaata acttactggg ggtctctttt ttgccctcaa aatttgctan cccagtaagn 480
cccttgcagc tctgttattc tttataanca acaatgcccg ctttttnccc nccctgaatt 540
ttcttggggt ctactgggct taaccctcat g 571

<210> 800
<211> 204
<212> DNA
<213> Homo sapiens

<400> 800
gctacaggga ggcactggaa gaatttaaag tgggagaatg atatccattt ttcactccaa 60
gttgaaaagg cacaaaactg gaggtaaaga agtctacata ggaggtcaag gactcctttt 120
ctggattatc ctaattaact attaagggag aagaattaga gacctagatc ataacagata 180
attcattaaa ctagaacttg gaag 204

<210> 801
<211> 528
<212> DNA
<213> Homo sapiens

<400> 801
gtaactccct tcccaaccca tgggagacaa agtggctggc ctgcagaagg catccaggag 60
ggtgacgaaa atgaatccaa ctaaaaatac ttgcttcctg agtcttcctt acaattagga 120
gtagccttgt aaccttgttt agccgacaag aggaatgtcg agatttgcag ggagttttgc 180
tccgttgccc agactggagt acagtggcac gatctcagct cactgcaacc tccaactccc 240
agattcaaga gattcctgtg tctcagcctc cgaagaagct gggattacag gcatgcaaca 300
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tggtctcgaa ctcctagggg cctcaagtgg tccacctgcc ttggccttcc gaagtggctg 420
gggttacagg catgagccac cacgcccggc caagacaata acatttttaa tcctacatca 480
aaactttaca tttcaaaaaa tgcattttct angctgagac atttttat 528

<210> 802
<211> 468
<212> DNA
<213> Homo sapiens

<400> 802
ttgaatacaa ggatgtggtc aactatactg ttcttaccgt tgaaaaagaa gtgctgaggc 60
caggcatggt ggctcacacc tgtaatccca gcactttggg atgccgaggc agctggatca 120
cttgtggtca agagttcaag accagattgg gcgacatgat gaaaccccgt ctctactaca 180
aatacgaaaa ttagccattg tggtggcaca cgcctgtaat cccagctact caggaggctg 240
atgtgggaga actgaaccct ggaggnggag attgcagtga gccaagatgg cgctactgtg 300
ctccancctg ggcaacaaan caacactatg ttttaaataa ataaataagt gctgagatct 360
cagaaaattc ccnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnggggggc cgggggncct 420
tttttntttt natttaaacc gggttantt tttaaaaagg ggggggg 468

<210> 803
<211> 212
<212> DNA
<213> Homo sapiens

<400> 803
gcttatgtgg gactgctctt cttcncagaa cagtggctan natgacantt ttattatgat 60
ncacttccac ttaatgaaca gcctgagccc cttcaccttn tgccatgngt ggaagcagcc 120
tgaggacctt cccnaagggc agantctggt ggcatgctcc ttgtccaatc tgcagaacta 180
tgagccaaat aaaccatttt tctttataaa tt 212

<210> 804
<211> 323
<212> DNA
<213> Homo sapiens

<400> 804
attattttgc ccttctgcct tcttccatgg gaaanactgc aatgaaagcc ctggccacat 60
gcancccctt catgttggac ttnccagtcn tnagaaccat gagccaanta aacttctatt 120
gcttatnaac tactannatc tcaggcatct tgttaccgga gcacncantg gtctttnaca 180
tttaataatg tgaaatgcnt tggagtntgc tttgtacatg atnagcactg antaaatatt 240
anagatcctt angngggganc nntncattgn tacctctctt ataataattt aaaagttata 300
aaaccaaaaa gccttcgaac tgt 323

<210> 805
<211> 477
<212> DNA
<213> Homo sapiens

<400> 805
accgagtctc gttctgtcac caggctggag tgcagtggcg caatctcggc tcattgcaac 60
ctccacctcc caggttcaag tgagtctcct gcctcagcct ccccagtagc tgggactaca 120
ggcgcacacc aacacaccca gctaattttt gtatttttag taaagacggg gtttcaccat 180
gttggccagg atggtctcga tctcttgacc tcgtgaccca cccaccttgg cctcccaaag 240
tgcagggatt ataggtgtga gccgctgtgc ccagccgccg ctgaatgtat ttcttaccac 300
caatctgttc agtcattact attccttccc cctttcctaa gtaccatggg aaatgaagca 360
taaagcactc aaagtccaag gaaaaggcaa cattcaggat cagttncaga atgtctgnct 420
ctttcagacc catgctccca ccagttgggc atgcattctt caacttggat gcctatg 477

<210> 806
<211> 324
<212> DNA
<213> Homo sapiens

<400> 806
ttttttttcta gtgttcaaag gccggcggat catgaggtca ggagttcgag accagcctga 60
ccaacatggt gaaaccccgt cttcactaaa aatacaaaaa ttagcctggc atggtggcgc 120
gcacctgtaa tcccatctac tcaggcggct gaggcagaag aatcgcttga acccgggagg 180
cggaggttgc agcgagccaa gatcacacca ctgcactcca gcctgggcga cagagcaaga 240
ctccgtctca aaaaagaaaa aaaaagaatt ttttttaaaa cttcaataaa aacttaggtc 300
ccattaaatg gtaaatctgg ctcc 324

<210> 807
<211> 288
<212> DNA
<213> Homo sapiens

<400> 807
ctatgtcctg cttctccact tacaaggtca tatgcaactc gaatctctgt ctacccacct 60
ggcatccacc cttccagacc ctgcttaaat gctacctcct caaatgccaa cgaactccaa 120
aactcggttg ttcattctgg tggaagctga tctctccctc cttggcagcc tgtgtccccg 180
tgatgcgttt tgtaaacttg cagctacttt gatcttgtct tggattgtac ttgggtctta 240
ccttaaccct tggtccagat ggcaaatacg gacagcccct gtgagctc 288

<210> 808
<211> 277
<212> DNA

<213> Homo sapiens

<400> 808
gactgcccca gtctacacaa atcccttcct tctagcagac tgagtcacac aagaataagg 60
agagtgaagt ctacatgttg gggactagag tgaatcgaag cttttctgga aggagctccg 120
tgaacctggc tttgagaatc tataaaaaac aagccaagta aaatgtccaa gaggtagtgg 180
tgctgaagaa tccaagaact tttcgaaata cttaacaaaa ctatcacaaa tgtattccaa 240
taaaacattt tgcgatagca nannaaaacg aaaaaat 277

<210> 809
<211> 418
<212> DNA
<213> Homo sapiens

<400> 809
gaaaagcacc aaggatggag cagcctggcc tttgccccat gctggttcct gcaggtgcaa 60
agggagaact actgctaatg ggacagagaa ggtccatgct gcacatggtg cagagatcaa 120
caggtcttga gcctccagag ctgtcagcct agtgcttttc atgcgcctta aaagtgaatc 180
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aatatgaagc atctgggaga aacagagact atattcaaaa gtttacataa aactgaacag 300
aggagggagg cggagagggg tgactggtga tgttccagag taaaaaaaga aaaagaatcc 360
ttttcaaata tattggagaa ctcctactac tcatcattca gtaaaagcca atggaact 418

<210> 810
<211> 394
<212> DNA
<213> Homo sapiens

<400> 810
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ctgttcttac cattgaaaaa gaagtgctga ggccaggcat ggtggctcac acctgtaatc 120
ccagcacttt gggatgccga ggcagctgga tcacttgtgg tcaagagttc aagaccagat 180
tgggcgacat ggtgaaaccc cgtctctact acaaatacga aaattagcca ttgtggtggc 240
acacgcctgt aatcccagct actcaggagg ctgatgtggg agaactgaac cctggaggtg 300
gagattgcag tgagccaaga tggcgctact gtgctccagc ctgggcaaca aagcaacact 360
atgttttaaa taaataaata agtgctgaga tctc 394

<210> 811
<211> 473
<212> DNA
<213> Homo sapiens

<400> 811
gttcctaggc cccatccgag gcactgaata acaatctaca gggaagaaag acatcagtca 60
gattccaaaa cctcccacgg tctggcgata aacatcaagg aatcaatggc agaatacttt 120
cctgagaaat tactccatgc ccttgggtct agtgaagcct atttcatcca tctcggaggg 180
tccatattct gtgagaaaat ggccccgtca ctcaagagtg atgaaatccg tggagcacgg 240
ctgggctaga aatgattacc aaagcccgtt aggagatgcc aacagagact atattaacca 300
tcattccctc tgtcacagca atcttgaatg aaagaggaaa gaagactttc tgctggttat 360
ggnatcttcg ggaatcatct gacagcttat ttattaaatg catttaatat taattctnct 420
tgnactctag ctgaccttca gaaacattcn cgagtcntta agaaccccaa agc 473

<210> 812
<211> 301
<212> DNA
<213> Homo sapiens

<400> 812
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tttggctcac tgntctgcng gctgtacnnn aagcatggca cctgcatctg ctcctatatn 120
agttgncagc tntgntccct cacacacaaa gggnggtgtt aagaagttac ttcaaggact 180
gatgtcagag gcnaagnact atattgnttt tctgtnagtt tctattagta gattttgtat 240

gttacagaat atagaactag cagaatacaa tgaatcttaa tgaaccattt attaccctgc 300
t 301

<210> 813
<211> 370
<212> DNA
<213> Homo sapiens

<400> 813
gaactgagtt gaatacaagg atgtggtcaa ctatactgtt cttaccattg aaaaagaagt 60
gctgaggcca ggcatggtgg ctcacacctg taatcccagc actttgggat gccgaggcag 120
ctggatcact tgtggtcaag agttcaagac cagattgggc gacatggtga aaccccgtct 180
ctactacaaa tacgaaaatt agccattgtg gtggcacacg cctgtaatcc cagctactca 240
ggaggctgat gtgggagaac tgaaccctgg aggtggagat tgcagtgagc caagatggcg 300
ctacttgtgc tccagcctgg gcaacaaagc aacactatgt tttaaataaa taaataagtg 360
ctgagatctc 370

<210> 814
<211> 212
<212> DNA
<213> Homo sapiens

<400> 814
gtctctggct ccaaagagtg tacacctgag gagttgtagc caagggtttt catcctcaac 60
tcacctgatg cagagcatga gatctaagac tgtgaacctg atgcaatatt gggatgagac 120
ccatggagat cctggaatgg gaatgagaat attttctata tggaaaaaat gtgaataagt 180
ttcaaccaga cagcagtctg tggtagattg cc 212

<210> 815
<211> 196
<212> DNA
<213> Homo sapiens

<400> 815
atcattcctc tggggggaaac caattgccat gtcataagca gccctgttga gaggaccaca 60
tgatgagggt gtaagcctcc tgccaactgc catgttgntg agcttggaac tgcagcaatg 120
gctgacatnt tgacttgaaa ccttacgtga gaccttntgg attcctgacc cacagaagct 180
gcntgagata ataaat 196

<210> 816
<211> 188
<212> DNA
<213> Homo sapiens

<400> 816
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tcaacctccc aaagtgctgg gattacagga gtgagccact atgccncaca tggtattatt 120
attattgtta ntaatactac attgtgcttc ataaataatt gctaaatata caagaatatg 180
tttgtttc 188

<210> 817
<211> 394
<212> DNA
<213> Homo sapiens

<400> 817
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ggggctacgt caccaaccac atctacacct gggtggaccc gcagggccgc agcatctccc 120
cactctcggg cctgccccag ccccacggtg gtgccctgag gcagcaggag ggtgaccgga 180
ggagcaccct gcacctcctg caaggagggg atgagaaaaa ggtgagtggg gtggggaaag 240
gaggccagcc tctcagacac cgtattctcc ctccgaaccc agaacagcag agctgcttgg 300
aggccgcaag aagaggctgg ttctgtccag gctctgtctt ccctcaagtc tgtactgaaa 360

gggtggngtt ttttctttgc ttttcttttt gacc 394

<210> 818
<211> 392
<212> DNA
<213> Homo sapiens

<400> 818
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tccgctccgg acctcactcc tatattttgc tgagatgaaa accacaatcc ctgcactgcg 120
agactcatct cataattaga aaacaaagga ttatccaccg ggttctctcc cctcgccctg 180
tggccttgct gctcccctgc agttgctcca aatgacaaaa taatgacggg ttcgccttgt 240
gagagagggt ggcctgctca actccacgct ggcgctctga gggggggcaga agatgcctcg 300
tctcatttat gttgcaaaca gccttaaaaa ggacctgcag ggcgctgggc gtggtggctc 360
acgcctgtaa tcccagcact ttgggaggct gg 392

<210> 819
<211> 387
<212> DNA
<213> Homo sapiens

<400> 819
gcaaagatta aaacacatat catgcccggg cgcagcaggc tcacgcctgt aatcccagaa 60
ctttgggagg ccgaggcggg tggatcacct gaggtcagga gttcaagacc agcttagcca 120
acatgatgaa actccatctc tacaaaaata caaaaattcg ccaggtgcgg tggcagatgc 180
ctgtaatccc agctactcgg gaggctgagg caggagaatc gcttgaacct gggaggcaga 240
tggtgcagtg agctgagatc acgccattgc actccagcct gggcgacaag aatgagactc 300
cgtctcaaaa aaaaaacaaa aaaaaccccn cncntntnaa aaggtcctgg aatcatttan 360
ntnatgggtn taanaaactt gaatttt 387

<210> 820
<211> 636
<212> DNA
<213> Homo sapiens

<400> 820
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ggtttggaaa agtgggganac ttgcgggtga tgaatnaaan aatgaantgc cattggnang 120
ctcttggtgg atgggaaatg gataaagaag tggaaagaaa tcancttccg ctttcctttg 180
cagaactggg ccctatgatc tgggatggtg ggatgatgcg cctgggaaac aagtcaagca 240
agcaacttcc cgaaagggac aaccgaagat aagcaccttt tcacaaacct tcggggaaac 300
cgttcatttn ccccgcttga aacttctcac caagcattgg gcccatctcn ggnggggnngt 360
gcttcttctt tccttgggtg ccacttgact tggcttggtg gccccaacac aatgttgctt 420
ggccttacaa gcanccttgg ngggcntttc ctccgataaa aggggaacca cctttcctta 480
atttnnttnc taaatttttt tttttngggg aatcccnggg aanacccccc cttccaagcc 540
ccttgaaagt nnnagggact taancccttg gggcttttttn tttttnaaaa aaaccaaaaa 600
gggggttttt ttttggaagg aanaaaaccc tttttt 636

<210> 821
<211> 395
<212> DNA
<213> Homo sapiens

<400> 821
agacagagtt ttgccatgtt gcccaggctg gcctggaact cctgggttca agcagtcttc 60
ccaccttggc ctcccaaagt gttgcgatta caggcatgag ccactctgcc aggccaagaa 120
gtctttctta acggacccat tccaagcact tcaaccctag agtttgcatg gcagtgctct 180
gcgtttccct tcaggccagt aataggattc tggatggcgc atgggctctg gtattaattc 240
ctgccagccc acacctgatg ccaggcacac agcaagcatt gttgaaagga tgaaggcgcc 300
aacctccacc tacttcacca ccttcatctt gtccaatact gtccaaactc actttggaga 360
agaataaaca ttctttgctc tactttccac tgctc 395

<210> 822
<211> 143
<212> DNA
<213> Homo sapiens

<400> 822
gtcataagaa gcttacagca ttctgtggta tactgctgaa gagtggtggt ggttggagga 60
agcanatggc atgaaccctg ccttcctcta agagggtgtg aaatgtgatg attcaggctt 120
ttaaattaaa tgcataaaga ttc 143

<210> 823
<211> 442
<212> DNA
<213> Homo sapiens

<400> 823
tcagacttgg ctccacaact ggaacaggcc acagcttgcg aaagagccca tgagtcaatt 60
caacagagat gagctgggga agagagagga aataagaatc ctacccatga ttcaagtcac 120
tgtttaaatg ctgcctacat cttcatttat gcttcaacgg gatctcatga ttttgtctga 180
ttctaaatct ttctgctcca tggtaacctt caaaatcaac agccctgtga ttatggtgaa 240
accagaattc cggcagccac tggaggggag cagaacaggc ttggatatca ttcaaagcct 300
cattcccaga gaattgtcat tatttgaact gtttagtggt tttctggaag accccacttg 360
caagaatgtc tttatttgac ctgacctgct cagtgctaaa aatctaggga catttgttgc 420
gctcaattaa aaaccattgg tt 442

<210> 824
<211> 625
<212> DNA
<213> Homo sapiens

<400> 824
ataagtgntt ctccaagaat gatcccnaga ctngctaant gatgcntgga cnttctactc 60
tggtggatgg ccntanncgg aaagcnttgg ttgaaccnnc aaanatgggg atcaaggncn 120
tttgaacaaa ganggggatct gancgcacct ttctccngca cagctttggt naangaaaag 180
gctattcacc ttntggactt gaggcnacaa caagacaatn ctgcttgctt ntnatgcccn 240
ccgngntccc gncttgtcaa gngcaaaggg gccgcccggt tctttttgtn aaagaccnga 300
ccttgtnccg ggttgccctt gaaatggaaa ctgccangac ccaggcaagc gccgggctat 360
ccgtgggctt gggccacaga cnagggccgt tcctttgcgc aacttgttgc tcnggacagt 420
ttgtcacttg aaaccgggga aaggggactn ggcttgctat tttggggccg aaaattgccc 480
cgggccaang aacctccctg gtcaatcttc aanctttggt tccttggccg aanaaaaagn 540
aatcccatca ttgggggttg aaggcaaata gccggcnggg nttggcataa cncctttgaa 600
tacccggntt ancttggcca ttttg 625

<210> 825
<211> 161
<212> DNA
<213> Homo sapiens

<400> 825
gaaatgacca gtgctttggt taagaatgca cattatactg cagttctttg gggaatgaag 60
ccacccttga ctgaggtaat catcagttca aaggcaactc cttgttttat ctttgcacta 120
attgcttaga gaaataacca gacaatataa tttatgacaa c 161

<210> 826
<211> 162
<212> DNA
<213> Homo sapiens

<400> 826
aggagaatgt gctggctctg atgttcagtg acaagggaac agagagaggt aggaaggcct 60
gaaccagcca agagacttta cctgaggtaa aaattcctct tccttcaatg cctcaaatca 120
ggatcttgaa gttggaaaat aataaaagct tgtacagatt cc 162

<210> 827
<211> 505
<212> DNA
<213> Homo sapiens

<400> 827
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ctgttgatat cgatggaatt cctgaccagt aacatttcca tgaagatcat tacaatttat      60
ttcttgaaac tctggggagg catggaaaca tcacattgca gcagatgctg ggatgcagc      120
aatgaacaag acaggccaga tccctactct cagataaaca caatgatcca ggtcagtagg     180
catttggtag gaatctgcat caaactgttg ggcaatggta gacagcaaca ttgacgtctg     240
taaatttaca cttggatttt aagtttctgg ntggctgcat ccttcttctg aaagccactg     300
ctcttttcaa aaaaacctcc taaatggcta aanctctctg ggttgcaaca agttgctctt     360
tttccttgag ccttaagtta aggagtttgg gnagaagtaa tggcttcccc cactgctaac     420
ttcaaggngc tacactttct cttttctaag ttcctaatct ggcttacnca ttataaaaaa     480
cccttantna aaaatcccca attat                                           505
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<210> 828
<211> 350
<212> DNA
<213> Homo sapiens

<400> 828
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aatcaaaaag aaggatggga caaaaatcag caaacgtaaa aggaaaaagt aggccaggca      60
tggtggctca cccctgcaat cctagtacgc tgcgaggccg aggtgggcgg atcgcttgag     120
cccagagttc cagaccagct tgggcaaccg tggtgaaacc ccgtgtctac aaaaaaaaaa     180
tttagcctgt agtcccagct gcttgggagg ccgaggcagg tggatcgcta ggactcggga     240
ggcggcagct gcagtgagcc aagatggcgc catctcactt cacctgggcn acanagcaag     300
accctgtttc caaaaaaaaa ggaaaataaa aaagtngtaa aaaaaatttt                350
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<210> 829
<211> 479
<212> DNA
<213> Homo sapiens

<400> 829
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agacctgaat tataacaagg ctgcaggagt tccctgtggc catccggacc ctgggcagac      60
tgcaggaact ggggttccat aacaacaaca tcaaggccat cccagaaaag gccttcatgg     120
ggaaccctct gctacagacg atatctctga atggtgccat ggacatccag gagtttccag     180
atctcaaagg caccaccagc ctggagatcc tgaccctgac ccgcgcaggc atccggctgc     240
tcccatcggg gatgtgccaa cagctgccca ggctccgagt cctgtgagtg ctcacaagaa     300
ttctacagtc ttggcattgt gcccctaccc ccatgtccca caaaaagcct cttctgcttc     360
tgtccaattg gtcattttcc tttctggaga atgggagcaa cataagcttc tgctgaaacc     420
taccccaaaa agaaccgggt ttgaagnaca agttttgccc ttactaactg gaatggatt      479
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<210> 830
<211> 505
<212> DNA
<213> Homo sapiens

<400> 830
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tttgtcagtg tgcctgcgtg gcggaatctg ggccgtgtat ggaaaagata tattgaagct      60
gaagaggact gagagggtct ttttttccat gagagtctca ctctattgcc caggctggag     120
tgcaagtggt gcaatcttgg ctcactgcaa cctcctcctc ccaggctacc aagttgctgc     180
ctcaacctcc cgagtagctg gaactacagt ttacagagtt gcagggggag ccaaaacctt     240
gccgtaatcc taccattcac tgctgtgagt aatgaccatc tgctggggac tggagaagac     300
ccacccaatc aanttgactg gcttgggttg cattgataaa aggaangnca caanaaggcc     360
aataggattg agaaccactc ttccagnggn gggaacgatc tgcagccacc cgcaaaaatn     420
gnttcactnt tccantgnag gtnttttaaa aaatctntnt ntttgacata ctctttttn      480
aaaggnngtc ccaaaccaaa taaaa                                           505
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<210> 831
<211> 461

<212> DNA
<213> Homo sapiens

<400> 831
aacctgacct cttggcatct tcagagtgga aaacgaagcc cccaatcttc ctgcagggag 60
cctcatcgtt tccagcccgg cagcgacttc acacgggctc attaaactcc caaataacag 120
acttgctgtt tggctttggg gtttaagtgg cctggaacca aacccgaagt atagctgagg 180
tatgcctata gtctaattaa cttcacgaac tgcctcggga aagaatgaat gaactggaac 240
ttcatgcaaa agtgtataca ggccangcac ggtggctcat gcctgtaatc ctagcacttt 300
gggaggccaa ggngggcaga tcacctgggg gcaggagttc gagaccagcc tggcccacan 360
ggtgaaacct tgtctcttct aaaaatnaaa aaaantaact tgggcatggg gggccatgcc 420
tgtaatncca ctncnttggg aggnttgngc caaaaaaata c 461

<210> 832
<211> 502
<212> DNA
<213> Homo sapiens

<400> 832
aaggcaggaa tgtcaaggcc tctgagccca agccaagcca tcgcatcccc tgtgacttgc 60
acggatacga ccagatggcc ggaagtaact gaagaatcac aaaagaagtg aatatgccct 120
gccccacctt aactgatgac attccaccac aacagaagtg taaatggccg gtccttgcct 180
taagtgatga cattaccttg tgaaagtcct tttcctggct catcctggct caaaaagcac 240
ccncactgag caccttgnga cccccacttn tacccgncag aaaanaaacc cccttggant 300
gaaatttttc tttacctacc cnaatctata aaacggcccc cccttatctc ccttcactga 360
cttttttttta ngacngggcc cccctgcccc caggnnaaaa aaaaaagcct tnttcttnaa 420
aaaaaataaa aaaagnnnnn nnnnnnnggg gccgggggg caatnnagtt nggatttaac 480
caaagngggg gggggtccaa aa 502

<210> 833
<211> 427
<212> DNA
<213> Homo sapiens

<400> 833
gagactcctt gtggagggga gcccctgccc gctcacctgg atgaccatgc ctcacctctg 60
ccgatcacat gcaaatattt gtcctgttct gagacatcct cctgggtccc agcttcttct 120
cttgaagata cagatttcca gtgcaccatc agaagccgga gtaactgtga gtgggaggca 180
ttggagccgg ctgggaggta agcattcggg ccagcaggga ggaggagtcg cccatgtagc 240
agtgctggat gacaacattc ccacactgcc ctcggacaca tcacagaccc tggtaccaca 300
ggatccctct gattcaactg aagaagagat gcanaagctt gcatgccacc aagtaactaa 360
ttcgttcttc tcttcttata tccattgagc agtgtgcagt gttggcacaa tgcacagtac 420
ttgtcat 427

<210> 834
<211> 427
<212> DNA
<213> Homo sapiens

<400> 834
gaaactctct ggatggcgaa aacttctcaa agtccataac atttatctga cacctcaact 60
gtgaatttac atttcatttg catgagtctc atgtctgcaa ctaggttgtg gtgaccttga 120
gaacgagggg atcaagagcc ttgtccagca ctgggagtgg aggtggttgg aaatcccgga 180
cccccggtcc accagccttg gcctcctgca gatgctaggc tcaggatgaa gtgcggccga 240
agactgctgg gaaaagaaaa gaaagagccc taatgtgcca tatcgggcaa gccgtggggt 300
ggcccactaa ctgctttttt atgattggca cttactggct ctgatttaac cccacttaaa 360
gagtggtggc agcaattgtg gagggcctca aagggagact gatgcaagtg agggcaaagt 420
atatata 427

<210> 835
<211> 426
<212> DNA

<213> Homo sapiens

<400> 835
aaacactcgg aaggcccagc ggggccacgc tctgccaaag agaggctgac aaggagcagt 60
gggagggagt ggtggccgca gagaggggat gaacatgttc gtgggtgcca ccacctgcct 120
ccctgcagtg gttggacttc tgtaatgtta tgcaagtcgc ccaggtcagg gtgcgtgatg 180
acgacaggag gcccagggaa caggagaagg ctgagccgtg gagcataccc atgccaatgc 240
catttccaga gctcttgggg tagcagttga ggcccatttc ctctccccca agaacctaca 300
acactctggg ccccccaaaa acaaccccat ccatcttgga aagaatgtgc agaaaagagg 360
aaggaatggc cacctgtcaa ctacattgtc acagtactgc acatgaccat caccaaatgc 420
ccgcga 426

<210> 836
<211> 243
<212> DNA
<213> Homo sapiens

<400> 836
gtgtccttac aaggaagtgt ggaagagaac agatgctaat ttatgactcc ggatcaattt 60
gctcaaacct gcacacaggc attagaggca gaagaaggac accatttttc cccccgtttg 120
gtatatacca ttcctctggt tatgttgttt attgatatcc tgcctccgtg tcaggcttaa 180
tacaaataaa taaacaaaca acaatctcta ttttttaaa taaaggaagc tttttaacca 240
ttt 243

<210> 837
<211> 427
<212> DNA
<213> Homo sapiens

<400> 837
accctgtccg tcagccaggt gagcaagcct gggctagtta gctgaaggat aagagaccat 60
gtggaggaag ccagaggagc catccatctg gggccaccca aggtcagcca gcacctctaa 120
tcacagagcc acgagggagt tagcccagat ttagaaggtg aggatattga cttcatctct 180
tgatgcaagg agttgcagtt acattgcaaa gggatgcaga tacagggaag gttggagaat 240
tgcagccact tttgcacaat ctaccacaac tactgcattg tagctgctat gcacattaaa 300
taaagtaaag acatatgaaa catttatttt aanggtcctg acaacaaata agtgttcaac 360
aagtgtgagc tattattact gtttctaaaa tggatccctt atcatgggag aaggtcaaat 420
taatgcg 427

<210> 838
<211> 426
<212> DNA
<213> Homo sapiens

<400> 838
tttccttaca atcctgttgg gtaccagtct ccagaaagcc actatcaatc agctaacgat 60
ggcattaaag agtcaactat aggatcttcc agaacaagga ctacacttca ggaagatgac 120
cttcaacata ggagggaaaa atgtttcata gtcaatctag taagaagttc tgccttcaaa 180
gcaaaagaac taccatttat tagatgtttg ccatgtgcca ggcaatgtca caacccttt 240
atatctcatt taagttcata atcatcctgt gacataagca acactatgtc cccagttta 300
cagatgaaga aactaaggct caaaaaaaac attgtgaact ttccaaaggg cactgagcta 360
ggaagtagtg acactcggat tcaaaccttg gatctggcct actttaaagt ccatggtctc 420
aaatca 426

<210> 839
<211> 434
<212> DNA
<213> Homo sapiens

<400> 839
atggagtttt gctctgttgc ctaggctgga gtgcggtggc aagatctcgg ctcactgcaa 60
cctcctcttc ctggattgaa gcgattctcc tgcctcagcc tccaagtagc tgggattaca 120

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ggcgcccacc accacgccca gctaattttt tgatattttt agtagagatg ggtttcccga     180
gtttcactgt gttggccagg ctggtcccaa actcctgacc tcaagtgatc cgcccgcctc     240
ggcctcccaa agtgctggga ttacaggcgt gagccaccaa gcacggcccc gcagcctcct     300
tcttgaaaga gatgtccaca ccccatctgg cccntccttn tcccttcctc attcctaaca     360
gctggcctcc tgcggctgct cccaggatct tctgcagagt ccggtccagc caaccccacc     420
tacctggctc cggg                                                       434

      <210> 840
      <211> 433
      <212> DNA
      <213> Homo sapiens

      <400> 840
gaattgtctg gaatttntgt gnaanctnnn tanancgcca acgctgcctn ctcctganta      60
ntaactgatc nagaactcat ttatcaccaa ggggatggtg ccaagccatt catgagggat     120
ntgcgcctgt gatccgaaca ccttccacta ggctccactt ccaacactgg gaatcacatt     180
tcaacatgag agttggagtt gacaaatgtc caaaccatgt ctccatccaa ccatctatac     240
agatcttgga ttcaagaagc cttatgcctc ttggctaaaa agagtttgaa aatcctgact     300
cggcccattg tgctaaggnc atcanaaaat ggattctgca gaagcagatg ctgaaatact     360
ttggtgggca gggctcaaca tctccaggga cagggcaggg cagaagcaag gagctaaaaa     420
aactggatct cac                                                        433

      <210> 841
      <211> 425
      <212> DNA
      <213> Homo sapiens

      <400> 841
gttcagntna aaactgnnta naacgccaac nctgcctgga tcctgactct gttgggattg      60
ttctcagagc ctgctcagtg tacttggaaa tgtccttcaa agcctgctaa ctctcatcat     120
ttcagggttg atctgatatt tagaagcaac tgaaaatcat ttgaagccaa tcccagtgaa     180
ttaggtcatg taattcagct gtaaaaattt gcccctggct gcacctggca taggagtggc     240
acagagggga tcttgctgtg tcacccaggc tggagtgcag tggtgcagtc tcggctcacg     300
acaacctctg ccttccaagc tcaagtgctt ctcctgcgtc atcctcccac aggtgcatgc     360
caccaggggt tcaccatgtt gcccangctg gtctcgaact cctgcgctca agtaatcctg     420
tactg                                                                 425

      <210> 842
      <211> 276
      <212> DNA
      <213> Homo sapiens

      <400> 842
agaactgagt ccccttnncna ncnctcncnc tanncctcgc ctttttgcct tgtggangag     60
cccatgtagc aaaggacagc caatagccaa cagaaagctg atgccctcag tccaacagcc     120
tgcaagaaac tgaattctgc cagcaaccat gtgagattgg aagcagattc ttccgtgcag     180
tcttgtgaga gattatgaag caaaggactc aagttgtgcc cagattcctg acccacagat     240
accgtgtgat aataaatgca tattgtctta aaccac                               276

      <210> 843
      <211> 78
      <212> DNA
      <213> Homo sapiens

      <400> 843
gcgtctgggg agctcctgca ttaagncnaa ctgaggnttg catcgncagc ttctatatat      60
tacggccttt ttttttgg                                                    78

      <210> 844
      <211> 252
      <212> DNA
      <213> Homo sapiens
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<400> 844
gacgtctggg gagctcctgc attannnnag agctgnggat tcttatantg aaaatcnccc 60
cgggcntgng tttttaaaca aangacggaa atctttcttt ccgnnntnaa aggacacntt 120
ganagatgca gtangaagat ggaatccatg aaccacgaag tgggtcttca gcagacacca 180
catctgncaa caccttgatc ttggacttcc taagcctcca taacagtgag aaatnaacgt 240
gtttttttaaa cc 252

<210> 845
<211> 425
<212> DNA
<213> Homo sapiens

<400> 845
ccatgttgga actacatttg gaaaggnggt ngntnattaa acaangacgn aaatttttct 60
ttccnanctn aaaggacact ttgaaagggg ctnccttctg angccaaaag nttcgcccac 120
tctggaatgg agctgttacc tgncatcntn agcacantnt cncggnaaca gaaaaccaag 180
cactgcatgt tcccacttat aagtganagc tgaacgagca gaacacatgg acatatgaag 240
gggaacaaca cactctgggg cctgtgaggt gcagggagag catcaagaag aacagctaat 300
gggtgctggg cttaatacct gggtgatggg ttgatctgtg ccggcaaacc accatggcac 360
acatttacct atgtaacaaa ccttgacatt cctgcacatt gtaccccgga acttaaaaat 420
aaaag 425

<210> 846
<211> 261
<212> DNA
<213> Homo sapiens

<400> 846
gaagatgcca naggctgact cacttcctcc ntctctctgt gcgngcanaa aggaaaggcc 60
gggtaagatg cangccatct gcnagccaga agacangcct caacacagac tgaaccctgc 120
tggattttga nctggaantt ccgccttcca gaactgtgag agaaaaattt ttgtgttgtt 180
taagncaccc actcntatat tnngttatgg cagcctgagc cgattaatat gtacaacatt 240
ctatataaaa tatgaaacat t 261

<210> 847
<211> 203
<212> DNA
<213> Homo sapiens

<400> 847
gctgcatact gattcttaaa acatgaagaa catatggcat gaggatgaag agtggacaag 60
aggtcaaagt agctgaaata tataaaatgc taaaagtgta acaaaactga tttcaaccaa 120
gcacttgatc tcaaccaaac aaaaatgtat gcacaaaaga aatatgtcaa aataatacaa 180
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<210> 848
<211> 124
<212> DNA
<213> Homo sapiens

<400> 848
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tgct 124

<210> 849
<211> 315
<212> DNA
<213> Homo sapiens

<400> 849
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ccatcccggg gagagacaca tggaggagaa ggccacctgc aggcagaggc agagactgag 180
gtatgcagtc acaagccaag gagcgtctgg agccagcaag aggtggagat gcaagcaagg 240
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agcctccaga actgc 315

<210> 850
<211> 272
<212> DNA
<213> Homo sapiens

<400> 850
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caatgaatcn acagccccaa ttttccagcc ccttgccctc caaaatctcc ttaaaaaccc 180
cagtccanaa ctccccggag gatatggatt tgangatncc tctcgnctct ctacttggct 240
gccctgcaat cattaaactc tttctctgct gc 272

<210> 851
<211> 326
<212> DNA
<213> Homo sapiens

<400> 851
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atctgagtga gctgcccgaa ttgctgaatg gacagaagaa caaccctctg aatggtggaa 120
acagctgcct ccgaggcacc agccacacgg tctggctttg gtcaatcctg cacgattccg 180
caaggcacgg tgactcacgc ctgtaatccc aacactctgg gaggccaagg agggtggact 240
gcttcagctc aggagtttga gaccagcctg gcaatagggt gaaaccccaa ctctacaaaa 300
aataccaaat acaaaaatat atatat 326

<210> 852
<211> 340
<212> DNA
<213> Homo sapiens

<400> 852
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ctcggcctcc caaagtgctg gaattacagg cttgagccac catgcccagc caaccctata 120
gctttgcttg ttcatcctgg gaaggaactg tgcaagttgg cgcttcgggc ttggtataaa 180
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aacgttgcca ggctatcacg gccctttttgt ttgcaagaga gcagtgagta aattatatct 300
tgggcttagc aaagcaaaaa ataaacacga tgacagtagg 340

<210> 853
<211> 264
<212> DNA
<213> Homo sapiens

<400> 853
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agtgaactat gaacagccac tgcattccag cctaggtgac agangctata actgaagaag 120
tgggagaagg aggaaaaaga aggggaagag aaaaacagca agaacaaaat gaacaagaac 180
aggaagaaag aaagaaaaaa ttaatttaat atttttccct tggaaaataa aagctaaatt 240
ccaagaatat atcatttgga tcat 264

<210> 854
<211> 208
<212> DNA
<213> Homo sapiens

<400> 854

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ggacaaaacc agaaggtgtt ctacatataa ggctcactct gaagtttcag gctgctggac     180
tggttgcttc attacatgta ctttgttc                                        208

      <210> 855
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      <212> DNA
      <213> Homo sapiens

      <400> 855
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tttgcaaaat tttgcttttg tatatttttc taagaaataa tctatagctt ttattatgta     180
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      <210> 856
      <211> 142
      <212> DNA
      <213> Homo sapiens

      <400> 856
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cgagaactaa attggctggc accttattct tggacttccc agccttcaga tctgtgagaa     120
ataaacatct gttgttgaag tc                                              142

      <210> 857
      <211> 440
      <212> DNA
      <213> Homo sapiens

      <400> 857
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caaatggatt tgagactgag cgactcccat ctctatggtt ggtatgtgac ccatctatcc     180
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taaaagaacg ccatcgacgc tcccctgtct ttcagcgcct gcaggttccg ggaggncagc     360
ttccaacccg aaggacgtcg ggatgtcatc gtccttgctg ctttgccacc ccattcccgt     420
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      <210> 858
      <211> 460
      <212> DNA
      <213> Homo sapiens

      <400> 858
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ggcagaggag gaaagaaaga aagcgaaggg ggagctgcca cacactttta aaaccatcat     180
atctcatgan anctcnttcn ttatcacaag aagagcaggg gggaaatctg cctccatgat     240
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tanctgtagt aaacttgcaa natattaact gtcattgnct tgncnaaagg gggctcattc     420
caaannatta ttttgcncca tngggggacc cacacagcca                           460

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      <211> 375
      <212> DNA
      <213> Homo sapiens

      <400> 859
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tgaatttcgc atagtttgat agggcaatcc ttgcattgtt ctcagttctt aaaatttcaa 240
aatttccatt ttgaaangtt ccctccttat ttttggattt taagcatctt taaaaatctt 300
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gaattttttt taaaa 375

<210> 860
<211> 474
<212> DNA
<213> Homo sapiens

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<210> 861
<211> 341
<212> DNA
<213> Homo sapiens

<400> 861
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gtgctgggat tacaggcgtg agccactgtg cccggactga aactgacttt gaacttctgt 300
cttcagaatt gtatgcgaat aaatgtgtgt tcttttaagc c 341

<210> 862
<211> 197
<212> DNA
<213> Homo sapiens

<400> 862
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gtgangcacc agtggggaat gacagtcaag aagaaaccnc ggganaatnc nacccccttgg 120
nccancagca ccaccccctt gctttccgga actcagaagt ggtggagaaa aaaaataaac 180
ctcctttttt gtttatt 197

<210> 863
<211> 335
<212> DNA
<213> Homo sapiens

<400> 863
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aagttccacc gcttgtggaa ccgccatgca agttcgtgta ctggatccct tgggggaacc 120
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gtgctccatc attgtcctgc tgggccaaca accgtcgctt tgaccttgtt cgactttntg 240
ttaccacctt gcttnaaaat gccaaaagcc aggaaccggg aanggatgga aatcatttaa 300
aaaatgggnc ccctgaaaaa aaaaggccga ccggg 335

<210> 864
<211> 451

<212> DNA
<213> Homo sapiens

<400> 864
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ggctggagca gccaaatggg ccaacccctg gagtgccttt tttcttctgt gttaaaaagt 180
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cccaggactt aaaaaggttn ttattggttc catanaggct taaatttggg ggctcctaaa 420
gggatcacca tgggataaat aaaaatatac a 451

<210> 865
<211> 479
<212> DNA
<213> Homo sapiens

<400> 865
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<210> 866
<211> 160
<212> DNA
<213> Homo sapiens

<400> 866
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tgtccagaat taagcacatt tcctccattt tctcaaaaga gtttcctgga gaagtcagaa 120
gaaataatac aatttcctat taaatgcaac atataaccac 160

<210> 867
<211> 447
<212> DNA
<213> Homo sapiens

<400> 867
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acctgtttat ctgtcctaac gcaaatg 447

<210> 868
<211> 335
<212> DNA
<213> Homo sapiens

<400> 868
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cttcaaatnc tgggcacaag agtgattgac agcaatttga ttgattagag aggtttcttt 120
aagaagagct tttactctga ataaaatatt cctgtgagga agatgctgac tggccatcca 180

ggtctgcaga agacaagacc agaggaaatg gattttgaac atgttcccag agatctttta 240
aaaaattacc tgcaaaggag tttaancccc ggantancng aacaaagaaa gctgagggtc 300
tctcctgaag tgaatgtttt aaaaatagac agtct 335

<210> 869
<211> 320
<212> DNA
<213> Homo sapiens

<400> 869
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gcaggaaaca gcagaagaga agaaagttga gatgaagaaa aaaatatgaa cgaaggcaat 180
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ataaatgaga tctaatttac 320

<210> 870
<211> 795
<212> DNA
<213> Homo sapiens

<400> 870
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ccataattaa ngggttgtnc aangttggnt ttttccntaa antaatnaaa anaccaattn 480
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cccccccttt tttgg 795

<210> 871
<211> 264
<212> DNA
<213> Homo sapiens

<400> 871
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ncctggtgcc acgttaaagc ggatttggan tttatctggc ttgctgattg cntaccatct 120
ccccaaggag ttcaaattcc cacagtntac caacacaact gatgctggaa gctaaacttg 180
ctacaganaa ctgagagaac caaacaattt tcctttacct gttctcacga tacttgaaan 240
taaatgtcta catggaagga aagc 264

<210> 872
<211> 566
<212> DNA
<213> Homo sapiens

<400> 872
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taactncccc aaagnncaaa agaannnggg gttacctnna cggaacnaaa naaantggng 180
ntttcaaana aatgccngaa tcctaaaagt ttaaaggaaa ttatttcttc gaaatacaag 240
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ttggncncaa tgtttctagc accttt 566

<210> 873
<211> 90
<212> DNA
<213> Homo sapiens

<400> 873
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tatccagatt tttcttccaa ctttactttt 90

<210> 874
<211> 550
<212> DNA
<213> Homo sapiens

<400> 874
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ttttaaaatg 550

<210> 875
<211> 400
<212> DNA
<213> Homo sapiens

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<210> 876
<211> 578
<212> DNA
<213> Homo sapiens

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ctaaaagtgg ccattcncag ggagaactga aaaaaggccc tcggttagga aagaaacana 540
cggggggang gggccaataa ggggataaaa gctggcct 578

<210> 877
<211> 408
<212> DNA
<213> Homo sapiens

<400> 877
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aaacttctcg ggaaggctga ggcaggaaaa tggcgtggaa ccttggga 408

<210> 878
<211> 186
<212> DNA
<213> Homo sapiens

<400> 878
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aagctt 186

<210> 879
<211> 274
<212> DNA
<213> Homo sapiens

<400> 879
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tgctatgtct actaaaaaga aatctgagaa actg 274

<210> 880
<211> 319
<212> DNA
<213> Homo sapiens

<400> 880
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tgagagaccc acagaagggt gttctagaga tggatgagtc agactgcaag agagcaaaga 240
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taatcataat aataaagtt 319

<210> 881
<211> 433
<212> DNA
<213> Homo sapiens

<400> 881
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ccaatgactt atttgaaggt tggaacaaac cacataatca ccagattccc cacattcaga 180
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ctgtgagaag agggaagtga tccggacctc ttggctgggg ccacactggg tttatctgta 300
tctgctcctg aatcttcagc ctgctacaat ctgttcacac ctgggtatct acagtcttga 360

catcctacca cttgctgctc aaggctctta acttgagctg gaaagtaaat aaattgngct 420
ttcattttcc cct 433

<210> 882
<211> 454
<212> DNA
<213> Homo sapiens

<400> 882
gatcgaggcc atcaagctac agatggtctt acaaatggca ccccaaatga gctcaactca 60
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acctccagag gacactacaa ctgcagggcc ccttcttcgc ccctatncag caagaagtaa 180
ctatgagcgg tcatcaccca attcccaaca gcagctgggg tgtcctgttt agacgggggt 240
agggggagat tgagaggtga agccagctgg acttcctggg ttgactgcag acttggagaa 300
cttttctgtc ttaccagagg attgtnnaat gcaccaatca ncactctgtn taaanacacc 360
antcagtgct tcttgtagnt ngcaagaaga tttntaaaat gcacccacca gcacttttgt 420
aaaatgcacc aatcaggcgc tttataaaaa tgcc 454

<210> 883
<211> 175
<212> DNA
<213> Homo sapiens

<400> 883
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aagctgctga cacacattct cacaggacta tggcaacttc cggaagctgc ctgtatgcct 120
tgtcttgtgg ccccttcctc cctcttcagt gccagcaaca ttgcatttac ctgac 175

<210> 884
<211> 377
<212> DNA
<213> Homo sapiens

<400> 884
gaaaagcctt gaaaattttt ggagtacata tagtaagaat gcacttcact gcagcaaaaa 60
tggagtttca ctcttgttgc ccaggctaga gtacaatgga gtgatctcag atcaccacaa 120
cctctgcctc ccaggttcaa gctattctcc tacctcagcc tcccaagtag ctgggattac 180
aggcatgtgc caccacaccc agctaatttt ctattttttg tagagacggg gtttctccat 240
gttggtcagg ctggtcttga actccagacc tcaggtgatc cacccgcctc ggcctcccaa 300
agtgctggga ttacaggtgt aagccaccgc acctggctta aaagtaaatt ttaaaaataa 360
acagtttata aattaag 377

<210> 885
<211> 260
<212> DNA
<213> Homo sapiens

<400> 885
tagatgcaat ccatggaaca ctccacgtgg acttggctgt ttctccgcat tcatggacaa 60
ttaatttcca gctataatcc agtttcccac caaacactga gttgcctccc aacgctgtcg 120
accacttgct ggaacaattg tcccccccttt gcatgggaaa gcaagatatc atgacacttt 180
gttctgatgt gcaaaacatg cctggttttg agaccctggc catttccatt gtcagtcttt 240
aattaaatca gtggttttct 260

<210> 886
<211> 435
<212> DNA
<213> Homo sapiens

<400> 886
gcaatccagg tgacaatacg gaagtttcag gaactccatc atatccagca tgtcaggatc 60
tcacatgaac gaatggcata ttccactcca tgtgagaaag gctgtgatgc catcatggaa 120

aagatctagc tttgaaagcc agaaagaagg aacatcagcc ttaacacttg ggagtaatgt 180
gacctggggt tgccgagtgc cttactgaac aatagctctg actggctgaa ttcatcaacc 240
caagtttgtg tatttagata tcatctatgt atctccgaat ctgctcctca acacacagct 300
agctgtcata atacataatc aactagtatt tctcaacaag caaattagta gactgtcaaa 360
gggattgctt aaccatatgc ttctctcatt actacataat cccagaaaat aaaagtaaca 420
tttgtttaga atgac 435

<210> 887
<211> 437
<212> DNA
<213> Homo sapiens

<400> 887
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ttcctgcctt aactgatgac atttcaccac aaaagaagtg aaaatggcct gttcctgcct 120
taactgatga catggtcttg tgaaattcct tctcctggct catcctggct caaaagctcc 180
cctactgagc accctgtgac ccccactctg cccgccagag aacaaccccc ctttgactgt 240
aattttcctt tacctacccg aatcctataa aacggcccca cccctatctc cctttgctga 300
ctctcttttc ggactcagcc cacctgcatc caggtgaaat aaacagcttt attgctcana 360
aaaaaaaggc cagngaggcc aattcagctt ggacttaacc aggctgaact tgctcaaaag 420
gnggggcccc ccccccc 437

<210> 888
<211> 328
<212> DNA
<213> Homo sapiens

<400> 888
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ttctcctgcc tcagcctccc gagtacctgg gattacaggc gcccaccacc atgcccggct 120
aattttttgt atttttttag tagagacggg gtttcaccgt gttagccagg atggtctcaa 180
tctcctgacc ttgtgatccg cccgcctggg cctcccaaag tgctgggatt acagacgtga 240
gccaccgcgc ccggccccaa cattcttttt tgcttgggat aaaccctctt caggctgtta 300
atcaatatag ataaaagtat actgttct 328

<210> 889
<211> 450
<212> DNA
<213> Homo sapiens

<400> 889
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aaacttgcgt cactaggccc agtggggtgt gctccatcag acagaatgtg tgtgtcacga 120
gccttctaag aatcaggagg agggaagtca ttcataaagg aggcagatgc tgaaatgcaa 180
ctttggcttc ctcttccaag tccttcaact ataggaatgt ggccctttct tattcacaga 240
ggggctggat ttctctttac aacctgagta ccagaagctc cctacctttc caagtcagaa 300
cagaacagga aagtggctaa ttcgaccttt gcattctcca cactggggga gatcacaggc 360
caggctgcac acctctcaaa acccaacctc angacagacg tctacaggga atgctaagac 420
tttcgaaagc aggagaaaga tatgtccaga 450

<210> 890
<211> 245
<212> DNA
<213> Homo sapiens

<400> 890
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agaagaggcc ccagagtcta ccttgcaggc accatgatct tggatcttcc agtcttcaga 120
actgtgagat gtacatttct gttgtttaag cattcagtct ttggtatgtt tttatggcag 180
cctcggcaga ataagacact nattcatcta ngtataccat atacagttga cccttaaaca 240
gcatg 245

<210> 891
<211> 440
<212> DNA
<213> Homo sapiens

<400> 891
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ctggctaagt aacaagcaaa catttcggag cctaagtttg ggaaagagcc tgaaggcccc 120
tacaccctga agcaacattc caagccttgc tgctcacaat gcggtcccgg gaccagcggc 180
agcagcagca gcccaggacg cttgttagaa atgcggcacc tccggcccca cttcagacgt 240
tctgaaccca aatctgcatt ttatcacgat cccaggtgat tcatgtgccc gttagagtga 300
gcgaagccct ggattagaga acagaaatta gacgtgaccc tttctttgac aggaatttat 360
caccaggctc tatctcaaga actgngagaa ttcggntcaa natgtttgtg ataacttttg 420
agcagtactg actagcgtgg 440

<210> 892
<211> 334
<212> DNA
<213> Homo sapiens

<400> 892
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acctggnttc cccatccaag ccaaagagcc ctcttctgtg cctggactaa gaaacagaat 120
gaaaaaacca cacagaaaat cataagctgg ggaccaaagg cagtcaaccg tttctgcata 180
tgcctcaaaa tgtgactcaa tctagaggtt tccagtttca cctgagctgt taaatttaca 240
ggaagatctt caatgatctt cggaaaagac agaagagcaa gaaaatctga aaaggatatt 300
aataaaaatt aagctcaaag ggaaaaaaat agtt 334

<210> 893
<211> 352
<212> DNA
<213> Homo sapiens

<400> 893
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ccgccacctc ctgagttcaa gcgattcttc tgcctcagcc tcccgagcag ctgggactac 120
aggcgcgcca ccacaccagg ctaatttttg tagttttcgt agagaggggt gtcaccatat 180
tggccaggct ggtctcgaac tcctgatgtc gtgatctgcc cgcctcggcc tcccaaagtg 240
ctgggattac aggtgcagcc accgtgtctg gctgctccat tgtaatctta cgggaccacc 300
atgtatatgc aatccttggn tgactgaaat ggncntaang gggggattga at 352

<210> 894
<211> 525
<212> DNA
<213> Homo sapiens

<400> 894
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aaagccaggc ctgtgtcttg agagggcttc tcaccaaggg aagcttccag ggccttctcc 120
aaagcaccat attcaagcac tggatgctgc ttggacatat caattgaggt cccagagaaa 180
tcagtatggg gagaagaagg acttggaatc acacaaacat gggtccgaac cctgcttgcc 240
cttcccagct gggtaaactc cagggtctca ctctgttgcc caggctggag tacagtggtg 300
caatcatggg tcactgcagc ttcaactcct gggatcaagc aatcttcctg cctcaacctc 360
cccaatagct gggactcctg aatagacaag ggtcccacta tgttgnccaa gctgntctcg 420
aaattttggc tcaanaaatc ctccttgctt ggnctcccaa agngctgggg taacaggcgt 480
gagccncctt gnccaaccta ttatagtcnt attcttacat aaata 525

<210> 895
<211> 366
<212> DNA
<213> Homo sapiens

<400> 895
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tcttattgaa acctatttac caagtcacga ggaaaaaaga gctgaaggac aaatgatgct 120
gacaaggggga cagtcagaac ctgcatactt tgaatgcaat accagggcac tagtgccaag 180
agttacaaaa gaagaagagc cttttaactt tggcgggagt gcagaaggga ggaccaaaat 240
tgtaatttga acacattatt gagtaagatc atataatgga aaaggaggaa actggtttaa 300
agagatgaaa taaaggtaga ggttaattag aactaccaac ataaatatat gccctttttaa 360
aagaag 366

<210> 896
<211> 377
<212> DNA
<213> Homo sapiens

<400> 896
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catcagagga taccactgaa tccatgctcc acagcagttc ccagcaagct gcactcttcg 120
aaggcgggat gctgaaacct ctgcccccac cccctacatt agctttatat ccaaatgtga 180
ctcggaggct ggtgagctca aggtgatcaa tgacagctcc aatcaaagcc acccagtaga 240
cagtgcactc accactcctt gatataaaag gtgttttatt tctcatcctt ttatttttgt 300
cactgaaaga atgcttccca tgtgtggatt aattaaagtg taaacattaa atattgattg 360
atgcattatc agcatgg 377

<210> 897
<211> 392
<212> DNA
<213> Homo sapiens

<400> 897
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ggttgagggg ctggaaaaga ggaggagtca gcaagttgaa agtcacaaca gaccagccca 120
ctcccctcaga taaaagaaag gcacatcaca gttgtcacat cagcaggcta gaaaagccat 180
cccattcctg cggcaggcat tctgtcaaag aaaaagaaat ctgcaatgaa ttatcacatg 240
aagtcaaaca aggaaaggag gcaaaaagca agcagagccc tcttcctgtt ttgtagactc 300
tgctggctac aatctaatag aatgcttaat ctgaatattt ctggtggcaa aactatagca 360
accattctgt ctattaaaaa gtcagtgtgg tt 392

<210> 898
<211> 397
<212> DNA
<213> Homo sapiens

<400> 898
tgaaacacat atccaagaaa aggtagtctg caggaaaact ggaggaagac ttatgcttag 60
agtccttgct ctgcaaactt ctacaggaac cagtgtggac ttggaggcct tagcaaacta 120
tcacaggaac agaaaaccaa ataccgcatg ttctcactta taactgggag ctaaatcatg 180
agagcacaag gacacccaga gaacaacata cactggggcc ttctggagcg gggagagcat 240
caggaaaaat aactaatgta ctaggctaaa cacctggatg atgaaataat ctgtacaacg 300
aatccctagg atgcaagttt acctatgtaa caaacctgca catggacccc tgacttaaaa 360
gttaaaaaaa atgagtgatt aaaaacatta aaaaatg 397

<210> 899
<211> 310
<212> DNA
<213> Homo sapiens

<400> 899
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tcttccaatg ggacctacca ctatgggtca agtcatctga catctacaga aaacctacat 120
tgcttctttt aacatacaaa tataaacaaa cgtacaattt aggtaggggc ctcccacaaa 180
ataatcacct gatcagaatt atatattaag ttatgcttaa tatattatta tacattaaat 240
atatgattta aaacaaaaaa aaaanggcca gngnggccaa ttcagctngg acttaaccag 300

gctgaacttg 310

<210> 900
<211> 315
<212> DNA
<213> Homo sapiens

<400> 900
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aaaaaacctg cactgtagtg ataaaattaa gtccaacctt aaaaagagtt tcaaaattta 120
agaatgagga ggaagagggg cacctcacgt aacaggaagc agctacgaca gcaaagagga 180
acagatactg ccaaataagg gttcatactc ataccccac aaaggaaatc tcttaattgg 240
agacatcatg agatctgggc cattttccca tctcattgaa aaatcaatgt ttaaataaac 300
acacttttta tctag 315

<210> 901
<211> 343
<212> DNA
<213> Homo sapiens

<400> 901
tttttttcta gngttcaaag gccggcggat catgaggtca ggagttcgag accagcctga 60
ccaacatggt gaaaccccgt cttcactaaa aatacaaaaa ttagcctggc atggtggcgc 120
gcacctgtaa tcccatctac tcaggcggct gaggcagaag aatcgcttga acccgggagg 180
cggaggttgc agcgagccaa gatcacacca ctgcactcca gcctgggcga cagagcaaga 240
ctccgtctca aaaaagaaaa aaaaagaatt ttttctaaaa cttccaataa aaacttaggt 300
cccattaaat ggtaaatctg gctccaaaaa aaaaaagggc cag 343

<210> 902
<211> 183
<212> DNA
<213> Homo sapiens

<400> 902
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gcctttgaac tcctgggctc aagcaacctt cccgtctcag cctcccaagt agctgggact 120
acaggcgtgc gctaccatgt gtaatttcca tttttaaaaa gcacattaaa atcagagagt 180
ttt 183

<210> 903
<211> 517
<212> DNA
<213> Homo sapiens

<400> 903
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gccaactaca aagaatcatg ggatcataaa ccctcagaag tggaggtatc acggaaatga 120
gcttaatgtt ttatgctttc ctgtcgcctt aaactgccaa gaaggctggt gcacctcaga 180
ggaaagaata ctcacaggaa ttagtttccg gtccctgaaa cccagtcatt tcaacatgac 240
agctgtttga aatcccatgt aaccagaggg tttctgagac aggaagcaac agtggcacac 300
ctagctgagc acgggggaga gtaagaagca gagaggaaac aagctgaatg agaacatggc 360
ttggaggcag caaggaaagt ataaaaacaa tgaaccaggc caggcgcggt ggctcacgcc 420
tgtaatccca gcactgtggg aggccaaggc aggcggatca cttgagatca gaagttctag 480
accagcctgg ccaacatggt gaaaccccat ctctact 517

<210> 904
<211> 198
<212> DNA
<213> Homo sapiens

<400> 904
actataacaa tgacccccta tgaagaaatg cttccaagac cagcacacca gaaagaacct 60

cctgatggtg agcagggcca gaaccaccac ctgnctgtcn caacactaac tcttcatttg 120
attcctcttg aagtttggcc cgagtgtgaa aaatgactct tcttttaagg actcgtaata 180
aagcagaggt gacacaga 198

<210> 905
<211> 122
<212> DNA
<213> Homo sapiens

<400> 905
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ggaattttct gggttaaaga aaaataaagg aaagtgacaa ataaatgtaa tctaagatct 120
tc 122

<210> 906
<211> 456
<212> DNA
<213> Homo sapiens

<400> 906
caattttgct ccaggaagtc cttgggaccc aggctcctgt cagctcacca ttctatcagc 60
ccacagttaa gactgtggca tgtgcattcc agacagcaag actgagaaag gatcctgaag 120
aagagagaca agggctgtct cttagggaag gctccacata aaactaagct gccacatgaa 180
acttacgctt actctgcaat agccagaact cagtcccatg gccatgaaag atacaaggac 240
gcctctgttc ttggaagtca tgttctggtc aaaactggag gattctatca cattagaaga 300
atgagaaaac agacacctgg ggaaaactac attttctatc atgggaacag cactctattc 360
aagtgaactc acaattataa atgaagctac tataattctg aacaatgtac cacggctaaa 420
agtgcttcat tcactttact tactcaataa atttaa 456

<210> 907
<211> 475
<212> DNA
<213> Homo sapiens

<400> 907
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acctctgcct cccaggttca aggaattctc ctgcctcagc ctcccgagta gctgggatta 120
caggcgcctg ccaccacgcc tggctaattt ttgtatttta agtagagatg gggtttcacc 180
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gacttggaga cagtgagtta aaacagaaat aagaaggcng ccgaaaaaaa actccccaat 360
ggaatggggt nggatatttc atatncnccc caccacctca aaaatggtgg nccttgggag 420
ggatnggaan acaagaaaat tgggaggnga tgcatctttc aagccttagg aaaca 475

<210> 908
<211> 426
<212> DNA
<213> Homo sapiens

<400> 908
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tctgacaagc tggctcctct cctcagaaaa aagaaagaaa caaggagaag aggatgacat 120
tgaatgtatc agagaactaa gaaacttctg ccagcctgag caacttctcc agccagggcg 180
acagagcaag accatgtctc aaaaaaacaa acaaatgaaa aaagaaattt ctggatgagg 240
aggatgctag ctctacattc cacttcacaa ccaggcccta catcagccta tatttgaata 300
ccatggcaat tcactacccc acgatctgtg aggaaatttt tccttacact aaacagattg 360
ggccagttnc acactttggg actgncagaa aaagcctata tatctaatat aatttattat 420
aaatag 426

<210> 909
<211> 448
<212> DNA

<213> Homo sapiens

<400> 909
aggatcatat gaaattcata aacagaggat gaagaaacac agaagacaga ggaaggattt 60
agttttggga acatgtgcta atggccatca aacaattctg aaataactga aagagaacct 120
ttgaaacacc ctttagatta agagcctggc ttgtaatctg taacaacaaa cggtattaca 180
atgagaaaaa taaatgtcct gtcaaggcat tccttcaatg acatcttgtc acacaagtct 240
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aaactgaagt ggatgtcact gtcttctgtc ctaagaaaaa agaggataaa ctgtantccc 360
aaccncttcc gaagcttgag gcaggagaat ggcatgaacc cgggaggcgg agcttgtaat 420
gagtcgagat ggcgccctgc actcccaa 448

<210> 910
<211> 496
<212> DNA
<213> Homo sapiens

<400> 910
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acgggggctc acgcctgtaa tcccagcacg ttgggaggcc gaggcaggtg gattgcctga 120
ggtctggagt tcaagaccag cctggccaac atggtaaaac cccatctcta ctaaaaatac 180
aaaaactagc tgggcgtgat ggcaggcacc tgtaatccca gctacctggg aggctgaggc 240
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ctccagcctg ggcaagaaga atgagactcc gtctcaaaaa aaaagaaaga aagaaagaaa 360
gaaaaaaaat tcngctccag gcagacttct ttttntgntt ctgcctttaa aaaaatctcc 420
ttggcacagc ttcacntgat tggatgggag aggaaatttg aggctgggag acctcctana 480
ccacagctgt aatctt 496

<210> 911
<211> 309
<212> DNA
<213> Homo sapiens

<400> 911
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taggaaaagg cttgccccag agtgaagaag agaagaaaat tgactggtaa aatgaactac 120
aaatgtgaag aaagtgtaaa ggacccaatt gagaaatgag gtctatgttg cccaggctgc 180
ttgtgaactc ctggcctcaa gcgatcctcc tgcctcaaac tcccaaagtg ctggaattac 240
aggtatgagc catcatattt ggctaatttt acctcctttt taaataaagc tgactactac 300
tacaaaaat 309

<210> 912
<211> 188
<212> DNA
<213> Homo sapiens

<400> 912
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tcaacctccc aaagtgctgg gattacagga gtgagccact atgcccccaca tggtattatt 120
attattgtta ttaatactac attgtgcttc ataaataatt gctaaatata caagaatatg 180
tttgtttc 188

<210> 913
<211> 659
<212> DNA
<213> Homo sapiens

<400> 913
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accctaaagg aggagccagg gcaccagccg gatggaggaa aatctcctgg cccaagaaag 120
tgacagggga aagactcctt cttcccttgc tcacacaggc tcccaaacat cacttcccag 180
nggaaaacaa agtgcccatc tccccacaaa ggacttgtga agctcttgga agcaccaagc 240

aagaagactt tgtcaagttt cttgttcctt gggattgttc acccaagcca cattggggcc 300
aagccaaaaa tccttgaaga agcttgggct tgcaaagtca agaactcttt ctttaccttg 360
aaccccaagg gaagttggaa cccgggggc caccaagaag ccttgatttc ccaagnaaga 420
agttcttcct tcttaaaaaa ccaaaagggc aattggggga ccccccactt ttttnttcaa 480
cccgggccat tggtcttggn ccatttntta ccaagtttgg aagggccacn ttaaaatttc 540
aattgccttt gaaacccggg ccccttgggg ttttcaaaaa cccctcaacn ttnttggccc 600
acnttttttt ngggcttgga ngtnggaccc ctaaaaaacc caaagtttat taagccatt 659

<210> 914
<211> 465
<212> DNA
<213> Homo sapiens

<400> 914
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aaggattggt gccatctgga caggttgaag aggagtagga gggctttcgg atgtggagaa 180
tggcatgcac aaaagcacgg agcaacactt tatgccagtt ggattatggt ccattgggag 240
aaagatcaat taaggtgaaa ccccagtaga gaaagcactg gagaacaaca ttcattcttc 300
cttaataaat cttagtttta aatatttgct ttgagttttg ttccattaat aaagaaaata 360
agaaggaaaa ccccnnnnnn nnaannnnnn nnnnanggggg cngggggggcc cntttnnnnn 420
ggntttnanc cgggtnnntt tttttaaaag gggggcccc ccccc 465

<210> 915
<211> 124
<212> DNA
<213> Homo sapiens

<400> 915
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aaagacgact aacccacaac ctactcttct ggaaaataca atttaaataa aataatttta 120
agtg 124

<210> 916
<211> 440
<212> DNA
<213> Homo sapiens

<400> 916
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aagcgatcct cctgcctcgg cctcccaagt agctgggatt acaggcaccc accgccacac 120
ccagagagtg tgacgatccc cctgatgcgg ctgagatgtt ctgaaatgaa gacgttggct 180
ctcatcccca gcctgaagag agaaaattct gagatggctc ccttacagat tgagagcaga 240
tacggggttt caccgtgcta gccaggatga tctcgatcta ctgacctcgt gatccgcccg 300
cctcggcctc ccaaagtgct gggattatag gcgtgagcca ccgcgcccgg cgggttgngg 360
gttaatatta aggcacttgg gtanggaaca cagccaanaa cgattgcagg atgggtcctt 420
ccaggacact tgacgtctca 440

<210> 917
<211> 463
<212> DNA
<213> Homo sapiens

<400> 917
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cttgcctgga gcagccttgg ggaatcaaat aggagccagt ccctgccctc cagaaactgt 120
gtgtctgggg gagaagatca cacacaggaa aatcaagtgg tgacaagagg tgccatgaga 180
cagtatatag ttcatttccc caccgcaaga gtaaagggct tagggtcaga ggctttggtg 240
cctgagttct gactctgcca attattagca ttgggacctc agactcagct ggcagagagg 300
agaagcagcg ggacatcagg actatggctg gacgtcagan aaaaacaact taactttaaa 360
aggtggcagt tggatgggng taacttagga gaagaatctt gactgggaga cggccagact 420
tcanaagaag atgacctacc cccccatccc cttttcagct tcc 463

<210> 918
<211> 416
<212> DNA
<213> Homo sapiens

<400> 918
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ccactccaaa tgaaataatc agataacatt gaaaaagagg aaatccgcac aacgtccagc 120
tatggagtag ctacatggtg aaatgccggg aagatgtcca ggacaggatg tggtgacact 180
gtgggaaggc tttattgcag aagggaattc taagaagtgt gggagaacca tgaaatttag 240
cccagaagag taagaaacat tgtgccagga ttggaaagga acagctctga caaggaaaca 300
agaataggag aaaaatgcca gtgcagatag agggaggtgc taattgctct tagccaaaaa 360
cattanaagg atttgtcaaa aggagtctta cgttaaatat anaaagtctg cttctc 416

<210> 919
<211> 371
<212> DNA
<213> Homo sapiens

<400> 919
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tgacaaaata tttcttgctg ttagttgcag gagagagaaa agatgaatac tgatccacgt 180
ctgagagaga gacaaaaatt caagttggag aatggtccag atacatcacc aaagcaagga 240
ggactgtaag tggatatcaa gaacctgagt gcagagacaa gagacagatc tctgtttctg 300
aaaacatggc aaggaaaata acctaaatat cctctcacta tcaagcatta aaaatggtgg 360
attaaatttt g 371

<210> 920
<211> 373
<212> DNA
<213> Homo sapiens

<400> 920
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ccacaaactc agcagcttca aacaaccaaa atggattctc tcacagctct ggaggccaga 120
aggccaacac tcaaggtgta ctgggaccgt gctccctctg aagcccccag ggaagaatga 180
cttccttgcc cctgccagct cctggtggtg gccggcggtc ctgctcgctc cttggcttgt 240
agacacatct ctcccatctc tgcctccacc accgcgtggc cttctctgtg tgtctgtgtc 300
cagatttccc tcatataagg gcatcaagtc attggactgg ggccatcctc atacaacatg 360
ctggttagcc ttg 373

<210> 921
<211> 441
<212> DNA
<213> Homo sapiens

<400> 921
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cgctgcctta agagctgtaa cactcaccgc gaaggtctgc agcttcactc ctgagccagc 120
aagaccacga acccaccaga aggaagaaac tccgaacgca tctgaacatc agaaggggca 180
gactccagac gcgccacctt aacagctgta acactcaccg cgagggtccg cggcttcatt 240
cttgaagtca gtgagaccaa gaacccacca attccggaca cacctggatc tctttttcca 300
gtatcactat cagttaaatc ccgcctcccc cccccccgaa atttataatt tttttaaccn 360
ggcacccttg gagatttatt taggaaaact agngacnctg ntttntttga naacaganta 420
aanagcgngg gtggaacttt t 441

<210> 922
<211> 341
<212> DNA
<213> Homo sapiens

<400> 922
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aatacttgca actgtctgca gggcctcgga gacatgggcc aaatgggttt ccctcccgaa 180
tacccaggca tgacacaact tcagctttca tctaattata cactggacat ccacaccgtt 240
tcacctgcaa agggttctac tgttaaaata aataaacaaa ataaaccctc tcttttataa 300
tatgtgaact ttaaattaaa ataaaaaaac agattagcaa c 341

<210> 923
<211> 639
<212> DNA
<213> Homo sapiens

<400> 923
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aaacacaaga cacccagtta aaattcaact gtagggtttc gctttgccat gcaggctgga 120
gggcagtggt gcaaacaggg ctcacaggca gaggctgctc tgcctcctag gatcaaggga 180
tccccccacc gcagcctcct gagtaactgg gattacaggc acaagccatc atgcccaggc 240
aaggattcag ggacatctca gagccgctgg ggtctcgtcg ccttcaggtc gtctgggctg 300
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agtgagaacc atagcagaac cttcaaagca cctctcaagt cgggctggag tgcaatggcg 420
tgatctcggc tcaccgcaac ctncgcttcc gggtcctggt tcaagcagtt ctcctgctca 480
acctcctgag tagctgggat tacaggcaca tgccaccacg ctcaactaat ttttgtattt 540
ttagtaanag atgggggttc accatgttgg ccangctgnt ttcaaaactc ctgacctcgt 600
gatccgcctg cttcggnctt ccaaaatact gggattaca 639

<210> 924
<211> 322
<212> DNA
<213> Homo sapiens

<400> 924
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gattgacagt tacgtgcacc acatgaagaa aaaagcagag ttcttcaaac agcatgatac 120
tgtaagagaa ggaatggggg acaagatcta gggctgcagg attaaaaaaa caaccaaacc 180
aaacagctgc tactcttcat acgcgtcatt attcctttcc ctttatttttg tgaaatattt 240
aagtattttt ataaattgtg atattagctg cttaaagtat tgtaaataaa attaaatatt 300
gtaattaaag atgtatatat at 322

<210> 925
<211> 307
<212> DNA
<213> Homo sapiens

<400> 925
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ccagatgaaa aggaactgag agatgcctct gaccaacagc agaggaggaa atgaatctgg 120
aaacaaccat gtgaataaat ctgagaatga atgcaaccct agctgaacct taaagtacca 180
tctgacacct tcattacagc cttgtgatag actgagagcc agaggaccca gatgaaccac 240
actgggtacc tgacccacag aagctacaag ataaatggtt gctgcgataa taaatggtta 300
ttgcttt 307

<210> 926
<211> 410
<212> DNA
<213> Homo sapiens

<400> 926
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tggaaaaaaa catgccacct tcttgctgac attttgttta actctcttgg ccaagctgat 120
tcctccttcc tccatactcc caaggcacct gaggtctggc tcttcaggct gtgtgacgac 180
agggacttta aagaggcaat gaaggtaaaa tgaggtcatc aggatggact ccgatataac 240

cggtgtcctt acaagaagag aagacaggac acgcncacaa agcgagggtc agccatgtga 300
ggacagtgag aaggcggccg tcacacccca aggagagagg cctgggaana aaccaacctt 360
acaccttgac atcaaacttn tggtctccaa aactgtagga aaataaattt 410

<210> 927
<211> 668
<212> DNA
<213> Homo sapiens

<400> 927
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cctccgcctc ccgagttcga gtgattctcc tgcctcagtc tctggagtag ctgggaatac 120
aggcacccac cttcgtgccc agctaatttt ttgtttgtat ttttgtagag accgggtttc 180
accatgttgg ccactctggt cttgaactcc tgacctcagg tgatccgccc acctctgcct 240
cccaaagtgc tgggatgaca ggcttcagcc accgtgccca gccaagatca agttgttgtt 300
ggcagggctg cactccctgc aaaggctgta ggagacaacc catctttgct tcttccagct 360
tctaggggct tccgcagcat gccttggcgt gccttggctt gtggctgcat tactccaatc 420
tctgcctgta tggcaaatta cctcctcctg gtccatctat ctccctgtgt gtcacttata 480
aggacagtta tcattggatt taagtgccct cctggatgat ccaggatgat ctcatctcaa 540
gatccttaac ttaagtacac cacaaaagtc ccttttgcca aatgaaataa cattcaccat 600
ttncgaggat aaaggacttg gatacatctt tttgggangn caccattcaa cacactacac 660
taataaaa 668

<210> 928
<211> 484
<212> DNA
<213> Homo sapiens

<400> 928
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cctccacctc ctgagtacaa gtgattctcc tgcctcagcc tcctgaatgg ctgggactac 120
agagctgaag tctgcctttg ttactcagga gtctggaact cctggagttg aaactcctag 180
cctcaagcaa tcctcctgcc tcggcctcct gaagtattga aatgagatct ctctaagtgc 240
ctcaggctgg acacaaactc ctgggctcaa gtgatccttc tgcctcagcc tccctagtag 300
ttgggactac agagaatttc cctaggtcaa atggcaccca gaaactgcct cctctacctt 360
gaaagctaca ctgtcttaac cttgaccaat ggctgactga tgtgggaatn caaaagtcct 420
cctncttgtc tcaaggatgg agccttgctc tgtcactcaa gctggaacgc aatcgcgcga 480
tagg 484

<210> 929
<211> 379
<212> DNA
<213> Homo sapiens

<400> 929
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cctcactctg agggcaggct gaacacctta gggaccatca acccccggng gtgtcgtttc 120
cagtgaaaac cgaactccgg gatgtagccg gattgganag aagcgagtgg cgcgtgcgcc 180
cccttcctgc ggcggatgga tgaacgtttc ctccaaacct ctnaagagcc cgtgggattt 240
tacccttca cctgcctccg cttctgctgt atcttgtccc agttcgttaa gtgtgaaggt 300
ctcagcagcc acacctcgac agcataccgg gaactctcaa tactcctcta cccattagca 360
ataaacaatc caaaaattc 379

<210> 930
<211> 62
<212> DNA
<213> Homo sapiens

<400> 930
gctggagtaa aagggacatt gggaagatta gttggaattt gaacaaaaag ctccatttag 60
ca 62

<210> 931
<211> 418
<212> DNA
<213> Homo sapiens

<400> 931
atcaaaagca gcatggatct gcctgtggat gagtggaaat catatctgct tcaaaagtgg 60
gcttcactcc cgacgtctgt tcaggtcaca atttctacag cagagacctt gagggatatc 120
tttcttcact cctcttcact tcttcaacag agtttcgctc ttgtcaccca gcctggagtg 180
caatagtgcc gtcttggctc acagcagcct ccgcctcctg ggttgaagca attctcctgc 240
ctcacctcct gagtagctgg gattacaggc atgcaccacc gcgcccagct aattttgtat 300
ttttagtaga gacgggactt ctccatattg gtcaggctgg tctcaaactc ctaacctcat 360
gtgatccacc ctcctcggcc tcccaaagtg ctgggatgac aggcgagtta agcgcctg 418

<210> 932
<211> 83
<212> DNA
<213> Homo sapiens

<400> 932
gtgncggtgn agntggncct gcagngccga tccttncncc ctagtccnga tgccctggga 60
acctcttttc ataatctgca cct 83

<210> 933
<211> 369
<212> DNA
<213> Homo sapiens

<400> 933
ggtttgcatc gccagcttct atatattacc ggccctttttt ttttgctggg atattatctn 60
tgnaaaaacg ggggaanact acccttgtnt gctgggggagg ggacccgngg aaatggtttg 120
ggatatatga aaattacntc cnggagggat tttcctgaan aanataanaa aacctntggg 180
ggaaattttt gaaaaaattc catccaatac cgtngaaagt cttcaaaaat gcttgctcca 240
agtttcactt gataccngct tgnttcttga aatttgaaag gggacattgt ttttttatga 300
caagnnggaa agcttatgct aaatcctggg atnggggngn cncctttgta attaaaaaaa 360
taccccccc 369

<210> 934
<211> 475
<212> DNA
<213> Homo sapiens

<400> 934
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cctcattgct ggaggcagtc gctgttaaca tcttgtggcg aacactgagc ttcatggctg 120
actcttcaca atttgatggg gatcttgcta tgttgcccag gctgaccttg aactcctgac 180
ctcaagctgc cctcttgcct cagcctcccg agttgctggg attacaggtg tgagctgctg 240
cacctggccg atttantttt ctgtatgaga tttggtactc tgaatatttc tttcatccag 300
gagagagtta ttgcttctat gtgcagatct tatttgcatt tgggatcacg gactggaaag 360
ggctcagggg tttatatcat tgcaccgatt tacaaaaagt gttgacagcg gggaggganga 420
tctgaaatca gggccttcnc gaggaggctg gctgaccctn atttcctgct ggctt 475

<210> 935
<211> 486
<212> DNA
<213> Homo sapiens

<400> 935
gagagaggga tctcattatg actgagaaaa aaatatcaag gaagagttgc aacatgtcat 60
ttgcctccct ctggcctcat tgttattttc tcattctctc ctcccatatt ttgnaagagt 120
gcattgattt attgccattt tcattttta aaacatcttc ctcctacctc aacaagcatt 180
tttgcccaaa gcgagtatta acaacttccc cccagttctc cttgtgttcc tctgtcgagt 240

gttcttattc attccatttg tnaaaaaagg aattctntgg gccagcacaa agcatctgct 300
gcttctatcc aggcaaagaa agatggtggc atggggtttt tatttactga aggctgggac 360
gaacgcagag ctaagtgtgc attcctggtg ctcctggctt tgtaggtgat acaaaagctg 420
gtnnncctgg caagaaanaa aancccttcc agaangcaaa atcaatgccg gcnccccact 480
tcacca 486

<210> 936
<211> 506
<212> DNA
<213> Homo sapiens

<400> 936
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cctccacctc ccaggttcaa gcaattctcc tgcctcagcc tcccaagtag ctgggattac 120
agatgaggtc tccaagggac cagatggaga acagatgcaa ccacactgaa gtcagaatcg 180
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gcccaaccag ttcatccaag aggcctggaa ccacagcagc gtcgacagct gagatgagag 360
ttggtccctg atcttataca nancccgggt ttaagtttga nttctttctt ttccttgnca 420
agaacnttta aaaaaaaact ttttgggggc cggggcattt tcctggttnt tttccnaacc 480
naaaaaaaga ntttttttt aaaacc 506

<210> 937
<211> 172
<212> DNA
<213> Homo sapiens

<400> 937
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ggganccaat naaaaaaaaa tgcggggacn tctcatgatg acctgggncc ttggtntttt 120
tnaaataaan cctntttttt taccttgttc caataaaaaa gctgaacttt tt 172

<210> 938
<211> 592
<212> DNA
<213> Homo sapiens

<400> 938
agaactggag gcagtggcan tcattanggc tgtctttggt gccttaaaca agtatttgga 60
tcaaggtntt tgtaaataag aagatttttt ggatggatga agaaagatnn ctttattcna 120
gcacccaaaa aagccaaaag cnttttaant gcccatatta ttgtccccaa agaaaattgg 180
tataccaggg accctgggct taancttatt tcatttgcna tggcagggta ccattaaaag 240
aaaacaatta ngatgcccgn acccaaaaat gccaattacc ctgggaagga accagaccat 300
tagaggttgg gaaaaattat tntgggntat tggggaaagg ggtatttccc aacaaaaaaa 360
aggaccattg ggattgaaaa aggaccggaa cgactttctt tggaaccaag aaaaaacccc 420
canggaaaaa ggtcaaaaaa aaaaaggaaa gccnnccana gaatggattt tcttggaatg 480
gaaatantgg antgggaang aaccgacttn ttgcaangcc ctcnaacttt ttatttttca 540
acccnccaag gncttggttt caaacccttt caagggaang gggttttcaa aa 592

<210> 939
<211> 405
<212> DNA
<213> Homo sapiens

<400> 939
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ctcgagttca agcgattctc ctgcctcagc ctcccgagta gctgggatta cagacgcgcg 120
ccaccccacc cagatgatct ttttaaatgc aaaatgccat cgacgcaaaa aatcaaagaa 180
tcagcttaag ttccagaaaa aagaaaaacc naccnaatga acnatnagac naccnccncc 240
nccaccaaaa aagnctttttg gggattttgg gaaatatttg ngtntnattc ntntacttta 300
ccngngagaa aagagnnttt ttttanaant nggncntcca anatggagat ttaaaattca 360
tttanggctt ttggaaangg ttcttaaaan aaatggattt ggggg 405

<210> 940
<211> 147
<212> DNA
<213> Homo sapiens

<400> 940
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tttcccacat ctattatttc attttatcat tgtaactgtg actttcaaaa gaatgngagg 120
gcataattaa acatttactc acgaacc 147

<210> 941
<211> 224
<212> DNA
<213> Homo sapiens

<400> 941
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gtgttctctg tgacccagta gtgtgaattg cttatctgtt tctgcattaa ctcaaattta 120
tcagtgatta ttgcctgaat acctcatgct ttctgagatc tacaggtaca gatttagggt 180
tgaactcttt ctctaaataa atttaatcca tgtgtgttaa aaag 224

<210> 942
<211> 471
<212> DNA
<213> Homo sapiens

<400> 942
agccaataaa ttttcttggg gctcacatgt tttcataggc ccctgaaaag cccggaggcc 60
ctgggtactg tgcctttagt gccacgtgga aagaacagct tgggctcagg acttcaggtg 120
gtctccaccc ggccactgga gagaatgaga caaaaaagcc ccagatgagg agactcaaga 180
agctatgaaa ggtgaaggca tttgctcaga gtcacacagc tactgaggag caaaccaagg 240
atttaaccct tcatcccttt agctttgagg atctttcagc tgcccagtgc ccgtgaagat 300
gaataaatat taactattac tattatcatt atcagaatct tcctctccct gaaggaatta 360
aagaaaaaaa aaagcctcct nattctaccc ggttactnac tggngaaccc gaaggaaatta 420
gacttaatct ggcngggcct cagtttgtca cctataaaag gggatatag g 471

<210> 943
<211> 341
<212> DNA
<213> Homo sapiens

<400> 943
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ctagccaaaa aaagctggaa ngggggnccc ccanaaagtt ccaagtttgg atgggtggat 120
aaanaaaatc atttcctngg ganggacant tccgggaang gcactcttac gctttccnaa 180
aatcantctc ttacccctca aagggctttt atgcttgctt aaaggcaagg gccanccccc 240
cgagtttngg ctggggacct cttaaattta ttgggggggc nctccccctt gaatggtgng 300
gaaaaagggg gggggccttc ccttcattta aaaaaggtgg t 341

<210> 944
<211> 469
<212> DNA
<213> Homo sapiens

<400> 944
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tgcacgcatg aanaaaaggg cggccctttc ttcattatgt tctgatccga cacatggcct 120
tgaccagaag ccaagcagat gctggcacca tgcctcttgt acttcccagc atgcagaacc 180
ctgagagaca gtgtttcacc atgttgtcca ggcttgtctc aaactcctgg gctcaagtga 240
tcttcccacc tcagcctgac aaagtattgg gattacaggc gtgagccacc atgcctgacc 300
taaaacattt tcatcacctc aaaaatatct tttatgctct ttccaagtta atcaagcttc 360
tcacccccac cccaaatcca ggcagctgnt gggctgcttt ctgncactat aaataanaag 420

nggattttaa nagctcacat aaanggaacc atacagaata taatctttg 469

<210> 945
<211> 285
<212> DNA
<213> Homo sapiens

<400> 945
cacaaagatt gagaaaatgc tgttgncccc caagaaaaga gatttttcag caagatgtgg 60
ggaagaccag taatgaaagg gttgtgagat cttgaatttg caagtaatag actgcctcct 120
ggaccttccc cattgagatc tgtcctctga tatgagtgag gaatcttttt gtccatatct 180
tgagcatttt aaacaaaagt taagcttcac tttanattaa actgcatctc caaactttct 240
ttgaaaacta atgctgttag aaataaaaga caagtttgta tatgt 285

<210> 946
<211> 438
<212> DNA
<213> Homo sapiens

<400> 946
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ggggcgnttg nctatatgnt atttnccacc atattgccct nttttggcaa tgggagggcc 180
cggaaacctg gccctgtctt tttgacgaac attcctaagg gtcttttccc tctcgccaaa 240
ggaatgccag gtctggtgaa tgtcctgaaa gaaacagttc ctttgggaaa ctttttgaaa 300
acaaacaaac gttttgtaac gaccctttgc angcagngga accccccaac ttggcgaaan 360
ggtgnccttt tggnggccaa aanccccgtt gtatnaaaaa ncccctggaa aagggnggga 420
naaaccccaa gggccccc 438

<210> 947
<211> 172
<212> DNA
<213> Homo sapiens

<400> 947
aaacttataa gggggatact tatataaaca cantggccac atttccaaat cttcttttca 60
atcccagctg gtggattaaa cattttttgg gaaagtaacc tcctattata aaattaaaag 120
ccaatattaa gagttttnca caatcaagaa tggtcnataa aatttttaac tt 172

<210> 948
<211> 191
<212> DNA
<213> Homo sapiens

<400> 948
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tcaagtaatc catcctagag ggggngttct ttttaanaat ttgagaagga aaacgtacnt 120
cccanctnct tttatataat gcgagcaaac aaaatatttg ttacaacact tcattcaaat 180
ttatttaata t 191

<210> 949
<211> 516
<212> DNA
<213> Homo sapiens

<400> 949
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aggagttcca gaccagcctg gccaacacgg cgaaacccca tctntactaa aaatacaaaa 120
aattanccag gcctggtgga gcacgcttgt aatcccangt actngggagg ctaaggcagg 180
agnatcactt gaacccangn gangctgcag tgatctgaga tcgtgccact gcactccagc 240
ttgggcaaca gaacacagac tccntcttaa aaagaagaaa gaaagaactt ctattttta 300
aangtttttt cctttcattg aactccatnt atngcctttc cattcaaagc ataaagatta 360

aattttaaaa caaggcttgg ccccctggct tatgcctgta atcccancac ttttntgagg 420
ccaaggnggg cgggatcacc tganctcaaa ngnttagaat ccntnctggn taacattggg 480
gnaaccccct tnctntaaga agaaccccat ttttta 516

<210> 950
<211> 503
<212> DNA
<213> Homo sapiens

<400> 950
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ctggggcact tgggcagacc cccaaagaca tccttaaaga caagagaaat cgggggctgt 180
gtgaagatgt cacatctgca gatagggttc gaggtagagc ggccttttgg gttttctcct 240
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cagtccttga aggatttgct cccattctca gggagcaaga cccatcttaa acgtggaaac 360
aaatacagca gagtaataca tacttgaggc ttaatgnaaa gttaattcct cttggcacag 420
ccccagatat cttgaataaa tggtctgcga agtgctgaaa tatcttgata atgnccgttt 480
tacttttgan tatataatca att 503

<210> 951
<211> 472
<212> DNA
<213> Homo sapiens

<400> 951
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ctgngagcca accaaggaca gcctgactcc anaagataca ttcttccgaa ataagacata 120
aagccttttg tccagtagca cgatcgaggc tactctgcat acagatggag tttcactctt 180
gttgcccagg ctggagtgca atggtgccat cttgactcac tgcaacctcc acctcccagg 240
ttcaacggat tctcctgcct cagcctccca agtagctggg attacagaga tacgattttg 300
ccatgttgcc caggctggtc ttgaactctg cgctcaagcg atccacctgc ctcgacctcc 360
caaagngntg ggattacaga catgagcccc tgcgcctggc cagcttcacg catattgnta 420
taatcttcat ggacaaatcg aaactcaaan ggagntttgc tcttgttgcc ca 472

<210> 952
<211> 476
<212> DNA
<213> Homo sapiens

<400> 952
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cctccacctc ctgtcctggg ttcaagcgag tctcctgcct cagcctctgg agtagctggg 120
actacaggag gagcaagtgc cattctgcct caagacccta acccaggcat ctgaatctct 180
cctgagtggt ctcccttcat tccttttcag ctccacttgg cctagtgaac tccgactcat 240
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tctatatttc ttccatgaca ctcttcccaa atgtaactaa aggattactt gtataatttt 360
tcctttagca tttgtttttc aaactagact gcagctcact ggaagcaggt cactgaaatt 420
tagaaggccc aaccaacatc ttttaaatga aatcaataaa gcaaagatgg cacaag 476

<210> 953
<211> 353
<212> DNA
<213> Homo sapiens

<400> 953
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ggggataact acctgcagag aggagctatc ctctttgctg agagcttcag aggcctgcag 120
agacatctga acaacctgcc tacaaagagg agccaccctc ttcagagcct cctctctgct 180
gagaacagca gacagcagga tgaccagtgg gcagagaaga gctacccccct ccagggcctc 240
ctctttgctg acagctgaac actccatggg atgacctgcc tacagagagg agctacccac 300
ttccggtctc ttctgagcca ttctaacact aaataaaatt cttcttcatc ttc 353

<210> 954
<211> 326
<212> DNA
<213> Homo sapiens

<400> 954
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tttacacgaa gtttcaccac cttgcccagg atggttttca actcctgagc tcaagcaatt 120
cgccaacctc agcctctcaa agtggtggga ttacaggcag gagccaccaa gcctggcctt 180
acgtacatct tttgactctc caaaaactta actactaata cccttctgct gaccagaagc 240
cttagtagta acataaacag tcgattaaca catattttgt atgtttcatg tattatatac 300
tgtattctta caataaaata agctag 326

<210> 955
<211> 140
<212> DNA
<213> Homo sapiens

<400> 955
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ctcactgcgc atgcctccat cttcgaagag ctcctgttca ctgtactctg aaatagactg 120
tgcaaaacat taaaactgac 140

<210> 956
<211> 245
<212> DNA
<213> Homo sapiens

<400> 956
actccattgg caacggagca gcagaggaga gaagagaagc atctgaacgt tgagaggaga 60
agcagcagct ggacattgga gactacagtc ggagaggagt tcaaccagag atagttggag 120
agaagtttgg tcagacagcc gaactccagg gaaataccac cttctcgctc catccccttc 180
ccagtccccc ctcccactgg aagccacttt tatcagcaat aaaatcctcc gcgttcaaca 240
ccctc 245

<210> 957
<211> 373
<212> DNA
<213> Homo sapiens

<400> 957
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tcatcaagtc ccatagcccc tttgtctatg gaccttctgc cagcatcttc tgtaagacta 120
ttaaaatgca ccaacccaag gtctccagtg ctgctgagtc ccccgtgtca cctcctgcaa 180
ctgccacagt tgtcaacagc tcaaatccta gagaccttct tcattaggtc aatgagtatc 240
taaactttaa aaaataaata aaggggtaat tattagcttg ccccccatcc caacaaaaaa 300
aaaanggcca gngnggccan ttcanntnga anttanccag gntgaacttg ntnaaaaggg 360
ggggactacc caa 373

<210> 958
<211> 412
<212> DNA
<213> Homo sapiens

<400> 958
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ggcctccgct gctgacctct gaaacacaat tcccagtctg actacggaaa ctgttcagtt 120
tgatcctttc aacttatttg aatcctgaca aataagctca cagctgaaag gtcaacatag 180
tcgtatttca tcctccagag ctgttcttaa gacatctgca caacaaagca cttcttatag 240
cacctgacat gggccctcaa tggcactgta cctcattaaa aatgtcccct gcatgcgcac 300
gcattccaag gcacatggtc tggtgatggt ttaccaaata agtgtttaca gaagggttag 360
taaacaaggc agattgtcaa cttttccaat aaagcgtcac tatagtgctg aa 412

<210> 959
<211> 248
<212> DNA
<213> Homo sapiens

<400> 959
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ctcggcctcc caaagtgctg gaattacagg cttgagccac catgcccagc caaccctata 120
gctttgctcc acctgggagg agctggagga caaaggactt cacagaagaa tggagtccca 180
aagaaacagc ttcaggaact gaggagagcc agaaatttaa tgtatttagg gctcccttgt 240
gaaaacac 248

<210> 960
<211> 455
<212> DNA
<213> Homo sapiens

<400> 960
tgactgaaac gctgaaccaa gcttggagct ggagcagcca ttttgggcca cgaggtagaa 60
gccatgtgtt gaagagaatg gaacaagatg gaagaaacct ggtgatcagg gagccgccat 120
aacagtcttg ggttgtctct gtttacatga gagatgagga aactgaggct cagagaggtt 180
aaatatcttc ctcaagaatt ttcgccagag ctgggatttg aaccaaggtc tgcttgactt 240
agaaggcagt ggtccttgct ttctcccgag gagaagggag cagagatacc taaagatgcc 300
tgactcccaa tcccatggga acatgccccc tgcgggctca cttcctctcc tctttgtctt 360
caatttctaa gaatgtcttc ttttcactaa aacaaaacac tccagaatgc attctgcatg 420
aataaagact gccaactcca tggcagaaat aacat 455

<210> 961
<211> 443
<212> DNA
<213> Homo sapiens

<400> 961
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ctacgagagg atgagtcaaa actcagtaag aaaggcagtc ctggctccct gccatgcttc 120
tctcccctac cctgctcaca agggctgatg tgtggctctc caaccatcac tccattgctc 180
ctcaagtgga cagtggaagg acaaatgtat ttcagcccca aagcacaaat cacctgattc 240
aaccctcatg ggtgacctag tcaagtggcc acctctgggc cctacatcag cctgcccttc 300
cttttatcat accacctgtc taactgtatt ataaggatct ttttccatga ctaaattttt 360
ttttgaaaac aaaaaaaaaa aagggncnng gggnncnttn nnntnggnct tnannngggg 420
gaanttnttn aaaagggggg ggg 443

<210> 962
<211> 397
<212> DNA
<213> Homo sapiens

<400> 962
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tgcgcccccg ttgttccccc gccgacagag gcttgatgcc gcttcaagtg cccgcagtta 120
tttttgtcag ccatcctctc ctcccactcc tcccaaagaa agcattcagt gagtcatcgg 180
gagacccgga gacatctgac ggttgctcag ctggtatccg gccactgagg ggaaggagga 240
gtgtgttgat gtccccttgg actctccttg aagaaactgc atagattcac agactcctgg 300
aaaatcagaa tccagaatgt gcacatgata cacgtttggt gtgtgtgttt atttgtattc 360
actcacggat tcaacaaata tttgttgatt acctgcc 397

<210> 963
<211> 554
<212> DNA
<213> Homo sapiens

<400> 963

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gaggaactga cgagccttcn tctaccacat aaaaattgca gcaaaccctg cagctatcct      60
gaagctgcca tgctgaaaag gccaattggg agaccacata gagaccgaga gagacttcca     120
aggactccag ccaatcctgg gccccagcag tttgaatctc ccagcaatgc caccatacag     180
gagagggagc aaatactcan aagattcaag tgccagctgc atgggttgat acctacataa     240
aaggcattgg cattattcac aagagccaag atatggaaat aacctgtgtc cattgacaga     300
cgaatagatg agggaaacgt ggcatataca cacagtggaa tattattcgg acttaaaaaa     360
agaaggaaat cctgaatcct gctatttctg acaacatgag actgcaggac gttatggaan     420
tggcccatca tgctcttnta aaactttnca tccctcagnc aanaaggggg agcctattta     480
ccctggncct tgaantggaa naaggacttt tgccctggcn ttgtttttan catccccttg     540
ntgaaaaaaa aacc                                                       554

      <210> 964
      <211> 131
      <212> DNA
      <213> Homo sapiens

      <400> 964
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cctctgtgtg gaacagaaga tttttaaacc tgtatattta tagcaaacaa tgaatctcta     120
aatagttctc c                                                          131

      <210> 965
      <211> 305
      <212> DNA
      <213> Homo sapiens

      <400> 965
gctgtgatga acagaaagag gccttggaga gccgtgggac tcaggagctg gagccaggct      60
tgagacgggg tccagaagga gcaagatggg atgcctttgg actgagacct taaattccac     120
ccagtttatt acaaccatgc tcactcctct acctgccctg ccccaatcgg tgcaaactgc     180
cttctccagt cttgcttcct ctctaatcca taggttgtct ctgttttaag aaggcaagtg     240
gccagtgaga gccttaaact accttagtgt tctctaaata agatatgcct ccatggagtt     300
gtaag                                                                 305

      <210> 966
      <211> 601
      <212> DNA
      <213> Homo sapiens

      <400> 966
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tcctcacctg actgggaaca gctcgaaggg aaggacatgt ctccaaagac atgaggagta     120
ttcaacgtgg cattcgaggc gcaaggaaaa acctgcctat cccaagatct cagccccatc     180
agccagccaa gggatccaca atgaccctta tgaagtttca taaggaagct aattgcttaa     240
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tacttaaatg gctacataag aggacagtcc agtgacagac atggaaagag gcttagaggt     360
catctcattc atcacaccat tttacagagg aaagcaaaat gccatccaga gaaggaaagt     420
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gaagctgctt ncaaaaatct ttnctttcat ttggctacag agaagacatc agaaaacaaa     540
antttataac atggctctag ctctaactca ctattcacta aagggccaaa ttaatagggg     600
a                                                                     601

      <210> 967
      <211> 161
      <212> DNA
      <213> Homo sapiens

      <400> 967
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ccacctcagc ctctcgagga gctgggacta caggcgtgca ccatcatttc ctcctaaaat     120
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<210> 968
<211> 315
<212> DNA
<213> Homo sapiens

<400> 968
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tgcaagtcgc ccagcagtga agtaggaggc ttggacacag ggagagataa atgtgggttc 120
ttctaagaca gatgcaggat ccagcttatt ccttgaagtt tccagtgttc tgcactctac 180
tacttgacat ccatctttcc ttcatgaccc cctgctctat aacttcaggc tcagcaccaa 240
acagaataaa cagttgaatt aagtatggct actacataag gtcagatctc tataataaat 300
tctttactct acctc 315

<210> 969
<211> 280
<212> DNA
<213> Homo sapiens

<400> 969
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ttccttttca ttcttttctg ggcaaatcta aacctttgga gaagtagatg agtgaagtca 120
attgcaaaga agaggagttt gggacacaga cttgtgtgag gacacaggga gaagacagcg 180
tctacaagcc aaggagagaa gactcaggag gaaccagcct tgcccacacc ttgatcttgg 240
acttccagcc tccagagcat aagagaataa atttctgttg 280

<210> 970
<211> 587
<212> DNA
<213> Homo sapiens

<400> 970
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tgttcgtatt ttttgtaaag atggggtttc accatattgc ccaggctggt ttcgaactct 180
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tttactgagg gtccaaaaca caaaatcacc ttagaatcat ttggttt 587

<210> 971
<211> 485
<212> DNA
<213> Homo sapiens

<400> 971
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ggaacagagc caagtacttc ccaggctccg tgggcatcaa agggattgca ccttttccag 180
acccaatcca cagctgcagg cagcaggcag gagtctgcac tgacaaacga ctcacctctg 240
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ggcccaacct cactcaggaa tgcctgcgac ccagcagcct gtcgtgggct gtgctgcgaa 360
tgccacacat gggccaggct cttcctcccg caggcctttc cagctgtcct ctgcagcttc 420
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gtatt 485

<210> 972
<211> 221
<212> DNA
<213> Homo sapiens

<400> 972
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gttggagata caaattgaag ccagccccag ttcaaaactg ttacaaatgg agtctgtagg 120
catgaggggc tgactatata actcagagtt ctccagtact ttactttaat aaagaacaca 180
atctttatta aaggataagt aataaaaatg tgttgatgtg c 221

<210> 973
<211> 582
<212> DNA
<213> Homo sapiens

<400> 973
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ccaatggtgc aaccacagga ggaacctaag tgctcagctg agaagcaggg actgaatcaa 180
gcagcagaca cgatgataaa gtttggatgt ttgtcccctc aaaatctcat gttaaaatat 240
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<210> 974
<211> 223
<212> DNA
<213> Homo sapiens

<400> 974
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acgttctgcc gtctcagaat cccagcgggg cacagcagga cagaaatgct ttctcttttt 120
taaaggactt accattccgt attctgagcc tcagtggctt atctcatgtc gtgagtccca 180
ttaagccagc cacttggacc agctcaataa aatgctccaa tgg 223

<210> 975
<211> 536
<212> DNA
<213> Homo sapiens

<400> 975
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agaggtgaag tgtttggatt cagtctgagc caaaggccac tttatctggg tttaaggaca 180
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tactcattat ccctgctgtc tctggggact tcttaaatgt cagcaatcat tgtcatcttc 420
actgttgctc cgcagcaccg cacatggctg cacctgggcc atctnctctg atgtaaaggc 480
tgtgcagcca aaatttgcaa ttcttccccc agcttttaaa attgtgtaaa atatat 536

<210> 976
<211> 142
<212> DNA
<213> Homo sapiens

<400> 976
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tcacagcgaa cctcggtcac tgacactcaa aagaaggaat tatttcaact caataataaa 120
caaataaccc tattttaaaa cc 142

<210> 977
<211> 345

<212> DNA
<213> Homo sapiens

<400> 977
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ccgaggcctc cccagctatg cctcctgcac agcctgcaga actattacag ggagcaactt 120
gaatttaatn cttctgattc caagtgtggt gttctgcctg tgcatacgga agaaggacga 180
cacccaggaa tgtgcccact gcagatggga gctggaagaa actgccgtta tgtggagctc 240
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attgtcttga antttaaagg ttatccttaa aactcatgct tcctt 345

<210> 978
<211> 204
<212> DNA
<213> Homo sapiens

<400> 978
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ttcagagctg acctagaagc cagccactcc actcagaccc aattcggatc actatgttcg 120
tgaggacttt aacagcatca ggagctccct ctgactgcta tatgaagaga actgcactcc 180
tgcccgagca acagagcaag actg 204

<210> 979
<211> 309
<212> DNA
<213> Homo sapiens

<400> 979
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tcctcagcta catcgatgag cttggcagtg aattatctag tcccatccaa gcttccagaa 180
gactgcagcc ccagctgaca gcttgactgc aacctcatga atgtttctga gctaggacca 240
cccagttgct tctgaattcc tcaccctcag aaactatgat acaataagtg ctgattattt 300
taaattgct 309

<210> 980
<211> 589
<212> DNA
<213> Homo sapiens

<400> 980
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ggcggaggca ggacagccat cctcaagctg cgactcgcgc tacgaacact ctntacaccc 480
aggccttgcg gtgtccatgg tctcctgggc agatcttggc caagggtgtg ctttaggtgg 540
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<210> 981
<211> 259
<212> DNA
<213> Homo sapiens

<400> 981
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actccatcaa ggtggacaga cactcaacgc cctggtagat aacaaagaca acggtggacg 120
agcaataaag aaatctaaca aggtctcaaa ggaacagcaa atgaatttca attttaaaag 180
gacatgggtc attctagaaa tcaatgtgtg tgcaatccaa cagttccata tataaatacc 240

agaaaatatt tatgaagcg 259

<210> 982
<211> 191
<212> DNA
<213> Homo sapiens

<400> 982
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gtgccaaaaa caatgtctta tttggccatt tttcccttga ccctaatgct agaaaggaag 120
gagagaggga agcttaaata atttataaaa tcctggtgaa ttgtcaatta agtaaatcct 180
ttttaaaatt t 191

<210> 983
<211> 620
<212> DNA
<213> Homo sapiens

<400> 983
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gagatatagg aggtggactt ggaggtttgt tcggagtcac tggctgcagc aagtctcctc 120
ccacacagcc gaccccattc ctcagacctg cactctgtac agcatggcta ctgaccaact 180
catggttaaa tgcgtaggag aaactgaagc acagctgagg tgcccaccat cagtagagct 240
aggccagcat cagaggaagc tgggcctcca agcccttctc ggactcagaa tcctcccagc 300
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catgagttag gatccatgat tacagtccag tccctaagct ataatctctc agaaagagga 420
gcgacaagaa gcggatgtga gaaagtaaag agattttcag gcattaaaag catggaaaga 480
acaaggcagg ggagatgcct accccoctgc ctggaggact cttggcgctg tgctgggtnc 540
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tttgttgaat aaagattgtt 620

<210> 984
<211> 495
<212> DNA
<213> Homo sapiens

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gctaatagag ctgagccact gtcacttgtc atggatgctg aggccctgaa caacctagag 180
gatctaaagg caacactgag atcactgacc cgagtccttt cccagcgatc ctaaaataga 240
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gagtgaaagg ggcggggtca ccctaatgaa ctgaatcaca ggagttaact gctaactcca 420
cctgggcaca atgggtcaga ccaaagtcta aagctcaaaa cagtaaagca gacatttaca 480
ttggttcaca caggt 495

<210> 985
<211> 410
<212> DNA
<213> Homo sapiens

<400> 985
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tgtggatgac tcagagcagc tcatccatcc aactagagac tagagactgt caacagctca 120
gtaactttgt ctgaatatga aggacccgaa ggaccactga gattggagac agaacaaagg 180
ccacaggatt ctgctgcaaa ttctaacagg aggaggcaat ggcagccctt actaaaaccg 240
cagaactaca ggaagaggat ccctgagtgg gattcctgtg tgaaaggcat tttcaccttt 300
ttgtgtatct tcagaatctt aactttcatg agagaagaat agaaatgcaa caatggaaca 360
atccactgta tacacgtagc tgacaattta ataaacttga aggaaatgct 410

<210> 986

<211> 316
<212> DNA
<213> Homo sapiens

<400> 986
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aaatgtatct gcagacaggt caagttcatc gagagtcacc tcctgcctga cactccagtc 120
attaattcca gccataacta cagcttttat tggacaagag actgatttca gcactttcta 180
cagataagaa gaccatcaac catggattgg ttctggccgg tttccagaag atacactgtt 240
acatgccttc atgccctgaa aaggcatttt gatgtttagg gcctagttgt gatacattta 300
aatgtctcat ttctcc 316

<210> 987
<211> 295
<212> DNA
<213> Homo sapiens

<400> 987
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cactgatggc atgcccactg atgtgtatca agtgcacgtc ccgctgcgga aagagacacg 120
tgttcctcca aaaggcactc tgctttttaa ctctcaggtc tcagacaaca aaccaaagac 180
actcctgaga cttcagcagg agtgccccag acagtgcatg agcatgtacg atccattcct 240
tattttctct atgtcatttc cctgcagagt caaaacaatg cattcattta aagtc 295

<210> 988
<211> 426
<212> DNA
<213> Homo sapiens

<400> 988
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caggcatggt ggctcacacc tgtaatccca gcactttggg atgccgaggc agctggatca 120
cttgtggtca agagttcaag accagattgg gcgacatgat gaaaccccgt ctctactaca 180
aatacgaaaa ttagccattg tggtggcaca cgcctgtaat cccagctact caggaggccg 240
atgtgggaga actgaaccct ggaggtggag attgcagtga gccaagatgg cgctactgtg 300
ctccagcctg ggcaacaaag caacactatg ttttaaataa ataaataagt gctgagatct 360
cagaaaatac aaaaaaaaaa aggccagcga ggccaattca gnttggactt anccaggctg 420
aacttg 426

<210> 989
<211> 327
<212> DNA
<213> Homo sapiens

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catgcttact gccctttata aaagattcaa gctttctaag ttcagggtgt tgctccctgt 180
aatgaaaccc actgtgtttc caagtatcac ctggccctcc ctcttgatat ccctctttgg 240
gaactggggc tctaggaact gggaaaggca atgccaatac tctggctatt gctattactc 300
tgagtaataa aagttcctca tctctac 327

<210> 990
<211> 475
<212> DNA
<213> Homo sapiens

<400> 990
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tctaatagtg gaacaagggt tgtctgtggt gaacacaata atgtgccatc cagattgccc 120
ttcaagaagg gacttgctct aactgctaat agtgctgtca acaaaaagcc ttcatgggca 180
gattttcagg gacctcatca gatgcaaaga gacacttcac ccaatgtcat gtctttccca 240

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caaagcagga caactctgac aggtcatttt agtttcagac ctccccacag aagccatcaa 360
cactgccact ggacgaaaac tgtaactcta cttctccaca tgctcaatct tgnatccttg 420
ctctgccctc ataaatgttc atccaagggt acttcctaat aaatattctg catac 475

<210> 991
<211> 307
<212> DNA
<213> Homo sapiens

<400> 991
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gccatgtgaa tgagcttgga agtggatctt ccagcctcag tcaagccttc agataactgc 180
agccccatct gacagtgtga ctgcaaccct atgaaagaac ctgggccaga accacccagc 240
taagctgctg ctggactcct gactctcaga aactgtgtga aataataaat gctttttgtt 300
ttaacct 307

<210> 992
<211> 305
<212> DNA
<213> Homo sapiens

<400> 992
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gctaacccct ttttggatga gaatctgtct tctcatggag cctaaagagt tgtgaagatg 120
ggtatggtgg ctcacagctg tgatcccaac acttcggaag gctgaggcag acccctgaat 180
tccagcaacc agtttgaagt cccccacaga ggaacgggat ctgcaagaga atacagcttc 240
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ttcgg 305

<210> 993
<211> 326
<212> DNA
<213> Homo sapiens

<400> 993
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gagaatatga acttcgagaa catctgacct gctgccacct ggccagtgtc ctgcctttga 120
ggagtccagg atttacaagc ctgctgttct caaccttgtt tggcactaac acaccggaga 180
ccatcagtaa cggtgggtct gcaaggcaca gatcttcacc agggatcctt ggggagaaac 240
caagcaaact atttcctgac actagacagg cgtatccctc cctttgagaa aattcacttt 300
ctaaaaccat aaacaacagc tggttg 326

<210> 994
<211> 286
<212> DNA
<213> Homo sapiens

<400> 994
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attggatgga aagaattccc ctgcccttct cctgtttcag tgattgcaga agcactcaag 180
ctgaagcctc cctcccctgt gtctatgagt cactctcatg agccatactt gccaccctgc 240
accagacatc tggcataagt gaggaataaa cctctgtgtg gaatgc 286

<210> 995
<211> 223
<212> DNA
<213> Homo sapiens

<400> 995

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ccacgtggga ataaatcaag ttgaggcaga aactaaataa gaccccaatt ctaatttatt 120
aattcaatct tttgctctca ttttatctaa cacatgaatc agttcaattt ccaagccatg 180
tgtgctttcg atgtcaaata tataataaac taagttttca ctg 223

<210> 996
<211> 575
<212> DNA
<213> Homo sapiens

<400> 996
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agcgaaaatc tgccgcttca cttctgagcc cagcgagacc acgagcccac caggaggaac 120
gaacaactcc agacgtgctg ccttaagagc tgtaacactc accgcgaagg tctgcagctt 180
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<210> 997
<211> 527
<212> DNA
<213> Homo sapiens

<400> 997
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ggagataatc cacttggtta tccgcggatg tgaacataat ttggaggcag cagtcactcc 120
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<210> 998
<211> 373
<212> DNA
<213> Homo sapiens

<400> 998
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cagcctctga gtacctgggg ctacagatgc atggccacca cacccaggga aagtgcttac 120
ctcaactgcc aatttacgga ggatctctgt ggatggtaaa tcagagaaga gtgtgaaagg 180
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tgaatataat cggctgaaag agaacaccag aacactgttt agaaggcaac tataacatct 300
caaattagtg acgactgtca tctgaaccat ggagaagatt ttctaaaata aaactagtag 360
gaatttgtga ctt 373

<210> 999
<211> 332
<212> DNA
<213> Homo sapiens

<400> 999
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ggggcatcct ctctgcaatc atggctgtga gtgataggtg gacttgccaa ctccctgatt 180
acctgccatc catggaaagt caacacctaa atatgttgtc ttatactact agataatata 240

tgactattat actgcaaata atctttttga agcaaattat aggaataaat tgagactaag 300
aacaataata aacttgggaa atttacaaag gc 332

<210> 1000
<211> 556
<212> DNA
<213> Homo sapiens

<400> 1000
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aagtggaaga acattcctgg tagatggaac agcatatgcc aaagcacaga ggtccacatt 240
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gaccacgaac ccaccgggag aaatgaacaa ctcccacgcg cggncttaag aactgtaaca 360
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ggcccagttt taccccc 556

<210> 1001
<211> 232
<212> DNA
<213> Homo sapiens

<400> 1001
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gcctcttgga gtctcagtga gaaaacacca agaacccctc aaggagcagc tgcaggtgaa 120
gcgacgacat gcacagcatg catcagaccg cgctggacag aggcgcttgt tcctgtttct 180
acctctcccc acttcagagg attccttcaa taaaaatcaa tttccaaaca ag 232

<210> 1002
<211> 467
<212> DNA
<213> Homo sapiens

<400> 1002
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cacctcagat gtcataaaga acactgactt ggcaccagaa gatctgtact cacgtcctaa 120
ttcttcaatt taacaagctt tgtggccttg gagaaactgg ctgacatttt tgagcttcag 180
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acacttacat gtttataggc tgnctatggc ccttttcata atttgngctt ttcaattttt 420
tttctgggat ttaagtttta aaagaataaa ttttatcatg aatctat 467

<210> 1003
<211> 124
<212> DNA
<213> Homo sapiens

<400> 1003
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ctttgaagta aacagggcca gtcttatgag tcttggagta ataaaatgat tctgtgcttt 120
gctc 124

<210> 1004
<211> 530
<212> DNA
<213> Homo sapiens

<400> 1004

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atttgcttcc agtttgccct tcctcctagc tgaactccag gctccagccc agagaagcaa     120
gaaaagagca aacagaagtt attcacatgt gcatcagaca cgcaatccat accacagcca     180
ccagggtgat tgtccaggtt gtatttctgc tgacatcgac ccttcatgcc ttcctcttgt     240
tgacccttcc agctacacct agctcggtcc tcttcagagc cacgccaaca cccaggttcc     300
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gactcatagc atctcactna tttcttttca tcaagtagga ggnagcaagt ctgcactttt     480
gcatcacatt ttaaaaanat ctgggnggtt gttttttgc ccaaaactaa                530

      &lt;210&gt; 1005
      &lt;211&gt; 336
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 1005
gggggagaca gagtctcact atgtcactga agctggagtg caatggcatg atctcagctc      60
actgcaacct ctgcctccca ggttcaagtg actctcttgc ctcagcctcc tgagatgtgc     120
tccaccatgc ctggggaatt tttctatttt tagtagagac agggtttcac catgttggcc     180
aggctggtct cgaactcctg acctcgtgat ccacccacca tggcattcca aagtgctggg     240
attataggcg cgagctgctg cacctggccc cggttcactc ttgtgacaaa tttcttcatt     300
tgacaaaata aaagaaagaa tttcagtaca aaaatc                              336

      &lt;210&gt; 1006
      &lt;211&gt; 534
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 1006
acagattctt gctctgtccg accaggctgg agtgcagtgg cccgatctca gctcactgca      60
acgtccacct cccgagttca agcaattctt cggcctcagc ctcctgagta gctgggatta     120
cagatgtccc ccaccacgtc cggctaattt ttgtattttt agtagagacg gggttacacc     180
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agtgctgaga ttacaggcgt gagccaccac gcccagctga aactgttctt taaactgggt     300
agcctatacc aatgtaaggc aatgttgagg agtagatgcg gcctctttcc tcaaagagag     360
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gaacaccatg gagaggccac agctgtgaaa aaaagaaaan gatgggcccc ggttttacca     480
anggccccnt tcctggaatg aaaagggaaa aaaccnncct ttaaaaaaag agcc           534

      &lt;210&gt; 1007
      &lt;211&gt; 276
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 1007
atgctcaccc ttggaatcaa gctgccatac tgtgaggaag ctcaggctac atggagctgt      60
cacatgggtc tggccaagac agtccagcca acctctcagc caacagctag catcaaagcc     120
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tgaattcctg acctgaagaa taaatgatgt taagcc                              276

      &lt;210&gt; 1008
      &lt;211&gt; 327
      &lt;212&gt; DNA
      &lt;213&gt; Homo sapiens

      &lt;400&gt; 1008
cncctaaanc agggactggg gcttgncagn tttggaanaa ttgcgtnggn taattgcttg      60
aagnncggga aaaaaaaaag ccacctggcc ccagggtcaa aacctttgat tgaananagc     120
nccncctaaa aaactgtttt gcagaatcaa atgccacaga naagcanggt aaaatcaggg     180
gtggaaaaaa gaaccgcctg gggtccctgg tcacttttg tcctcatgtt tcccttggca      240
ttaataagaa atttaccana atgcnttttc gatnggatac caaagaagac attctggggt     300
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